

WELCOME TO ENGINEERING OPEN HOUSE



Daniel Drucker
Dean of Engineering

All of us on the faculty of the College of Engineering are proud of our students for displaying their optimistic but realistic faith in the future with their look ahead to the year 2001. In these times of severe and increasing national and international difficulty, it is essential to take the long-range view while tending to the problems of immediate urgency. Engineers, as all citizens, have a stake in the future. Engineers as professionals have the competence and the desire to help in the design of and for that future. The uncertainty is enormous. What the social and technological challenges will be then can only be dimly perceived today. Problems of energy, environment, materials, transportation and communication will always be with us but in forms beyond our imagination.

Only the highest quality of engineering education will do for

our students who must provide incisive leadership in the next century as practicing professionals. Education for the practice of engineering in the face of so problematic a future cannot be narrowly focussed. Programs must be broadly based on mathematics, the sciences, the humanities and social studies, and soundly developed through the engineering sciences to achieve an understanding of the fundamentals of engineering practice.

Our need for an ever-increasing level of technology just to maintain our civilization, but a population with about the same number of 20-year-olds a decade hence as now, makes it inevitable that we shall face a critical shortage of engineers long before the year 2001. Fortunately, women and minority groups are beginning to recognize the challenge and the satisfaction of an engineering career. The

increase in their representation in the profession of engineering will be to their benefit, the benefit of the profession and the benefit of society which will have such desperate need for their services.

We urge you to look around and become acquainted with our students, our faculty, and our facilities. Learn why the Deans of Engineering all across the country rate us in the number two position along with Stanford (see the Table below). Explore the range and scope of our activities from basic science through to the most applied aspects of design, production, and construction; from the teaching of freshmen and pre-freshmen to graduate and post-doctoral students. Distinguished and busy as they are, both faculty and students are more than pleased to spend this time with you. On their behalf and mine - welcome to Engineering Open House 1975.

2001: AN ENGINEERING ODYSSEY

March 14-15, 1975

TIME CAPSULE IS HIGHLIGHT OF OPEN HOUSE

By Bill Buford and Betty Richards

Co-chairpersons of Engineering Open House

What will life be like in the future? Utilizing the theme "2001: An Engineering Odyssey", the students and faculty of the College of Engineering will be displaying some of the possibilities to the 20,000 to 30,000 visitors that are expected to attend the annual Engineering Open House.

As a highlight of the 66th Engineering Open House, a time capsule will be buried in a courtyard on the west side of Engineering Hall.

The capsule will be buried at a dedication ceremony on Saturday, March 15 at 1 p.m. A stainless steel monolith will be installed to mark the site of burial until the planned recovery in 2001.

Each of the departments participating has contributed articles illustrating how its research is expected to influence life in the future. Among the objects, which are to be preserved in the time capsule, are a revolutionary airfoil, a ceramic bone implant, an automatic cow feeder, a computer-in-a-bag, a hologram, a plasma display panel, a pocket dosimeter, and a piece of coal.

The piece of Wabash County coal symbolizes the resources in Illinois and the related research being carried out at the University.

Developing and testing an effective gasification process is one of the active research programs of the Department of Mechanical and Industrial Engineering. The results of this program could make a valuable contribution to the energy needs of our society in the years ahead.

Ceramic materials will play a fundamental role in bone repair in humans. The results of materials

research in the Department of Ceramic Engineering will broaden the horizons of medical technology.

The Department of Theoretical and Applied Mechanics believes that holography will be increasingly used to study the behavior of structural components under load. The hologram contained in the time capsule will preserve the three-dimensional image of a slide rule, pocket calculator, model automobile and airplane. These images will be seen with the aid of a laser in 2001.

A new airfoil designed in the University of Illinois department of Aeronautical and Astronautical Engineering will revolutionize the aviation industry. This airfoil will allow large airplanes to take off and land on short runways and, in fact, will permit near-vertical take-off. A small piece of this airfoil will be preserved in the time capsule.

The Agricultural Engineering Department has developed an electronic dairy cow feeding system which enables dairy farmer to efficiently feed cows in proportion to the amount of milk that they produce.

A pocket dosimeter and a film badge, both of which measure radiation from x-rays, gamma rays, neutrons and other sources, were chosen by the Nuclear Engineering Department to indicate the maximum allowable level of radiation doses for humans. It is expected that future standards will be more stringent, which will require the use of more sensitive devices.

A "computer-in-a-bag" is one of the areas of current research in the Computer Science Department. Powered by solar energy, the computer-in-a-bag will never have to be physically connected to an external power supply. In fact, no physical connections of any kind are needed since the device "communicates" with the other computer elements by means of



Artist's conception of the new courtyard built for the monolith and time capsule.

radio waves.

A small stainless steel capsule containing a length of wire 10 thousandths of an inch in diameter was chosen by the Department of Metallurgy and Mining to illustrate the "Shape+Memory Effect." This wire, when heated, will bend so that the word "Metallurgy" is spelled out.

Another length of wire made of niobium and zirconium illustrates the development of the theory of superconductivity in the depart-

ment of Physics. This superconducting wire, when wrapped into a coil, generates a magnetic field of over 60,000 gauss with a current of less than five amperes.

The Civil Engineering Department has chosen a student and faculty roster and a statement from the department head as the Civil Engineering object to be placed in the time capsule. This is to illustrate that with all the advances in technology the engineers of today and tomorrow are the key to a bright future.

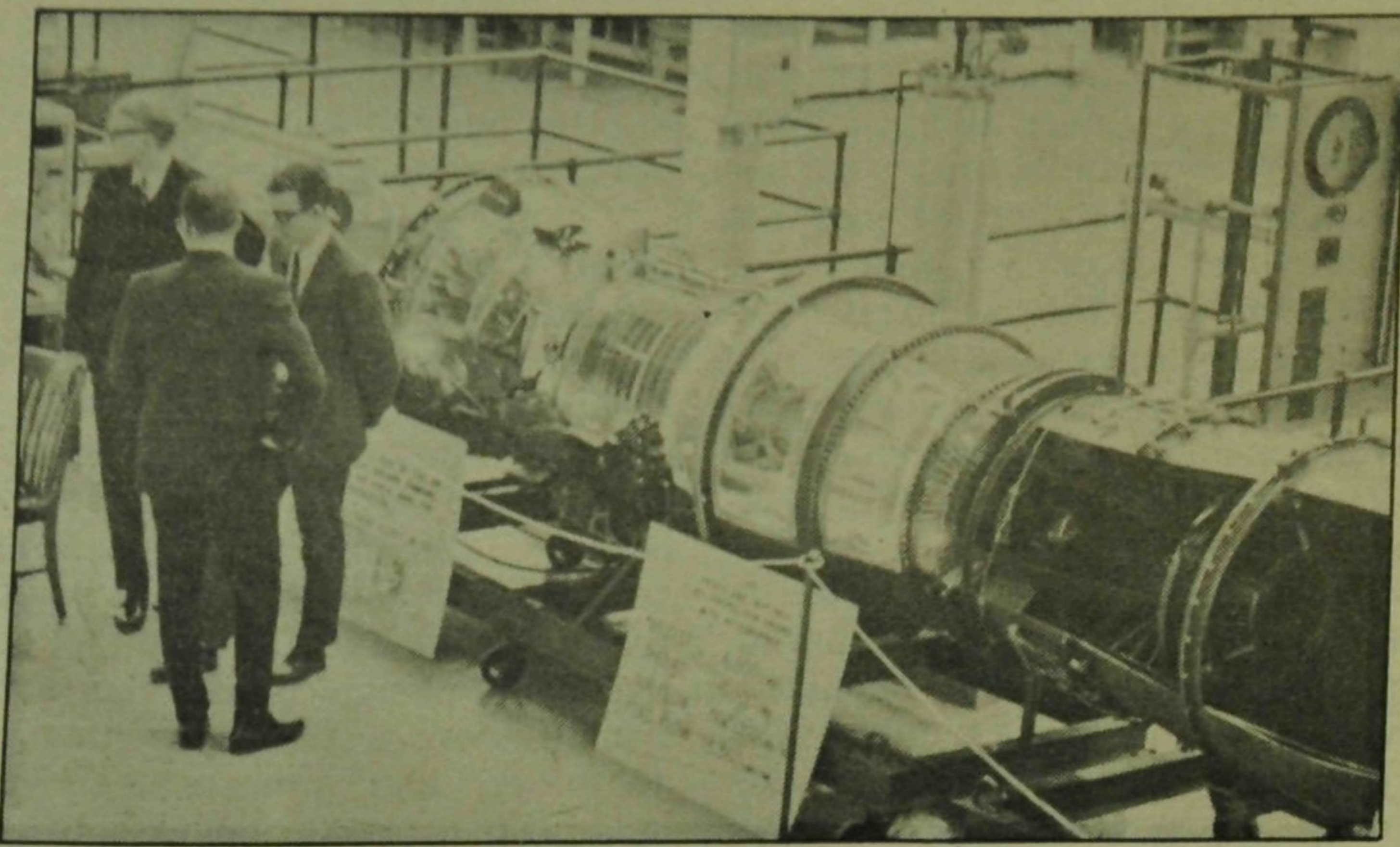
Top-Ranked Schools by Profession*

		Fraction of** Choices
Engineering		
1.	Massachusetts Institute of Technology	119/131
2.	University of Illinois	84/131
2.	Stanford University	84/131
4.	University of California, Berkeley	67/131
5.	California Institute of Technology	62/131
6.	University of Michigan	58/131
7.	Purdue University	42/131
8.	Georgia Institute of Technology	14/131
8.	University of Wisconsin	14/131

* Reprinted from Change magazine

** The number of Deans of Engineering who selected the indicated school as one of the five best in the U.S. divided by the number of Deans responding.

Aero Society Is Active



One of the exhibits at a previous Open House was a 600 lb. jet propulsion engine.

This year, as always, the student branch of the American Institute of Aeronautics and Astronautics (AIAA) will be represented in Engineering Open House. Close to 75 percent of the members will either be showing their own exhibits or working on departmental exhibits.

Throughout the year, AIAA plans many diverse activities for its members and offers exciting opportunities to further one's education in aerospace outside the classroom. In addition to EOH, activities this year have included a field trip to McDonnell Douglas Corporation in St. Louis, an employment workshop to help students who are job hunting, student-faculty activities, guest

speakers, movies, and playing basketball. If a person is interested in learning more about airplanes, rockets, or the future of aerospace, AIAA is the group to join.

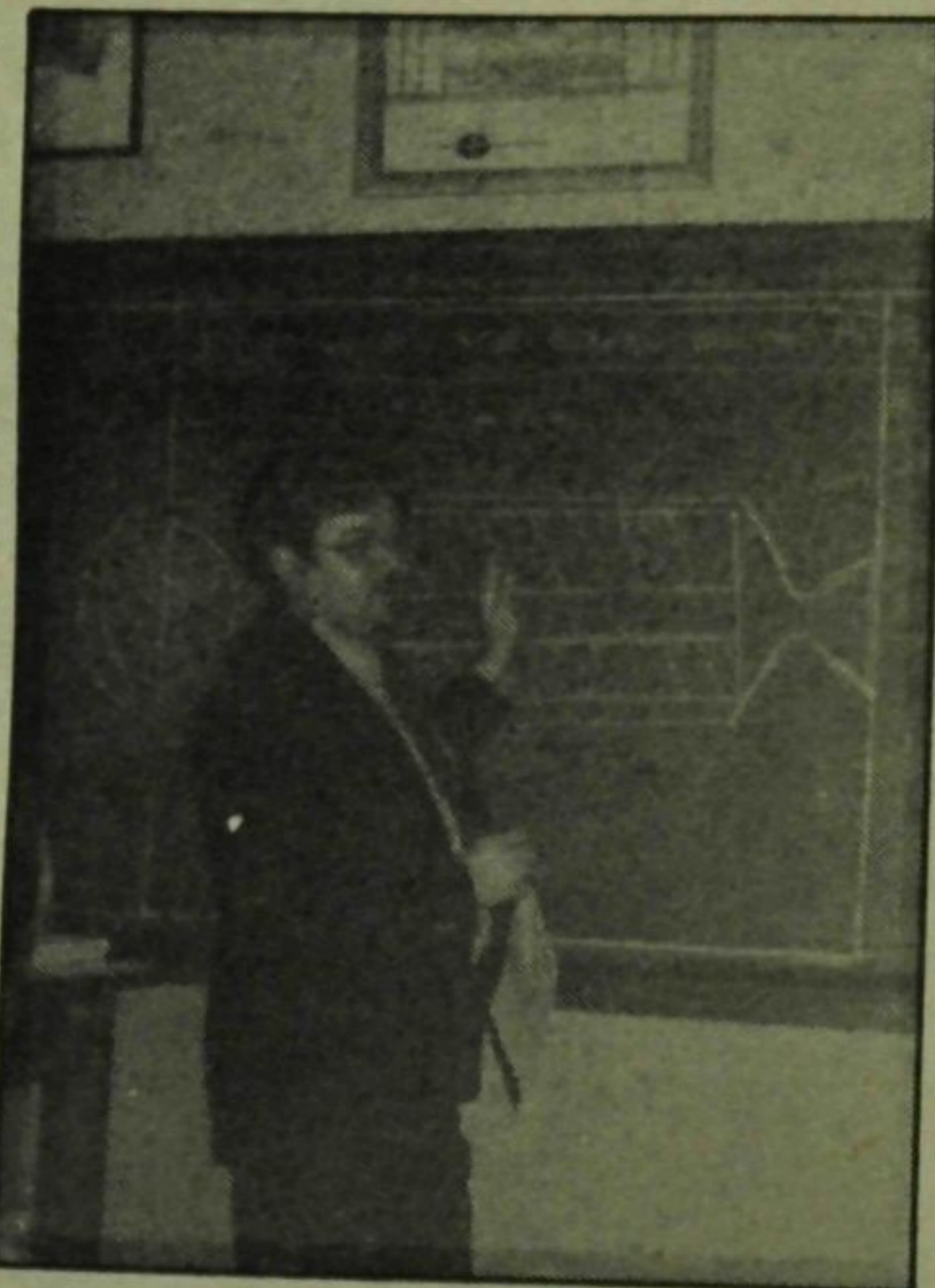
Membership in AIAA entitles a student to submit papers to the national organization and to compete for cash prizes. One of the members, Mike Micci, won the undergraduate paper award at the student conference which was held on this campus. This year's conference is at the University of Cincinnati and many members are planning to attend. Thus, AIAA offers education and fun for engineering students during the year.

QUIZ

by Engineering Speakers Bureau

1. To prepare for a college education in engineering at the University of Illinois, a student should have 3½ years of math and 2 years of a foreign language. TRUE FALSE
2. In the state of Illinois there are (3, 5, 7) accredited engineering schools.
3. At the University of Illinois at Urbana-Champaign, the fall semester enrollment deadline for engineering is December of the previous year. TRUE FALSE
4. The number of engineering graduates for the school year 1975-1976 is approximately (25,000 35,000 50,000).
5. The number of engineering graduates needed for industry, as measured by the U. S. Department
6. Starting salary for graduating engineers is about (\$9,000 \$12,000 \$15,000) per year.
7. About (1, 5, 10, percent) of all engineering freshmen are women and the increase in demand for women engineers for school year 1974-1975 was (10, 50, 100, percent).
8. (1, 4, 7, percent) of all engineering graduates represent minority groups.
9. First and second year pre-engineering programs exist at (most, half, few) of the Illinois Community Colleges.
10. Engineering is the (first, second, third) largest profession in the country.

For Answers See Page 15



Professor H. Krier of Aero Engineering is lecturing on rocket propulsion.

Aero Is Diverse

Basic to the Aeronautical and Astronautical Engineering (AAE) curriculum is the study of solid mechanics, propulsion, fluid mechanics, thermodynamics, orbital mechanics, structures, and control systems. The curriculum also allows the AAE student to choose from many elective studies in the humanities and social sciences as well as in science and technology.

The knowledge and abilities developed by an aeronautical or astronautical engineer can be applied to a multitude of problems in both society and industry. Aerospace engineers are involved in the solution of air and noise pollution and mass transportation problems. In addition, space research spinoffs can provide new knowledge in medicine, bio-engineering, and energy technology. The energy crisis has accelerated research in the development of alternate energy sources. These problems are being solved by aerospace engineers and their knowledge of structural mechanics, fluid mechanics, thermodynamics, and control systems. The talents of aerodynamicists are needed to design wind-driven electrical generators. Thermodynamics and structural and fluid mechanics are tools necessary for the development of coal gasification plants which extract clean energy from dirty coal.

The Aeronautical and Astronautical Department, therefore, prepares students for participation in the continuing exploration of space and for the application of aerospace technologies, to the improvement of life on earth.

Tau Beta Pi Honors Scholars

The Tau Beta Pi Association, national engineering honor society, was founded at Lehigh University in 1885 by Dr. Edward Higginson Williams, Jr., to mark in a fitting manner those who have conferred honor upon their Alma Mater by distinguished scholarship and exemplary character as undergraduates in engineering, or by their attainments as alumni in the field of engineering. Tau Beta Pi is the second oldest Greek letter honor society; the first is Phi Beta Kappa. Tau Beta Pi was founded after Phi Beta Kappa elected to have its membership be comprised of those persons enrolled only in the field of the liberal arts and sciences.

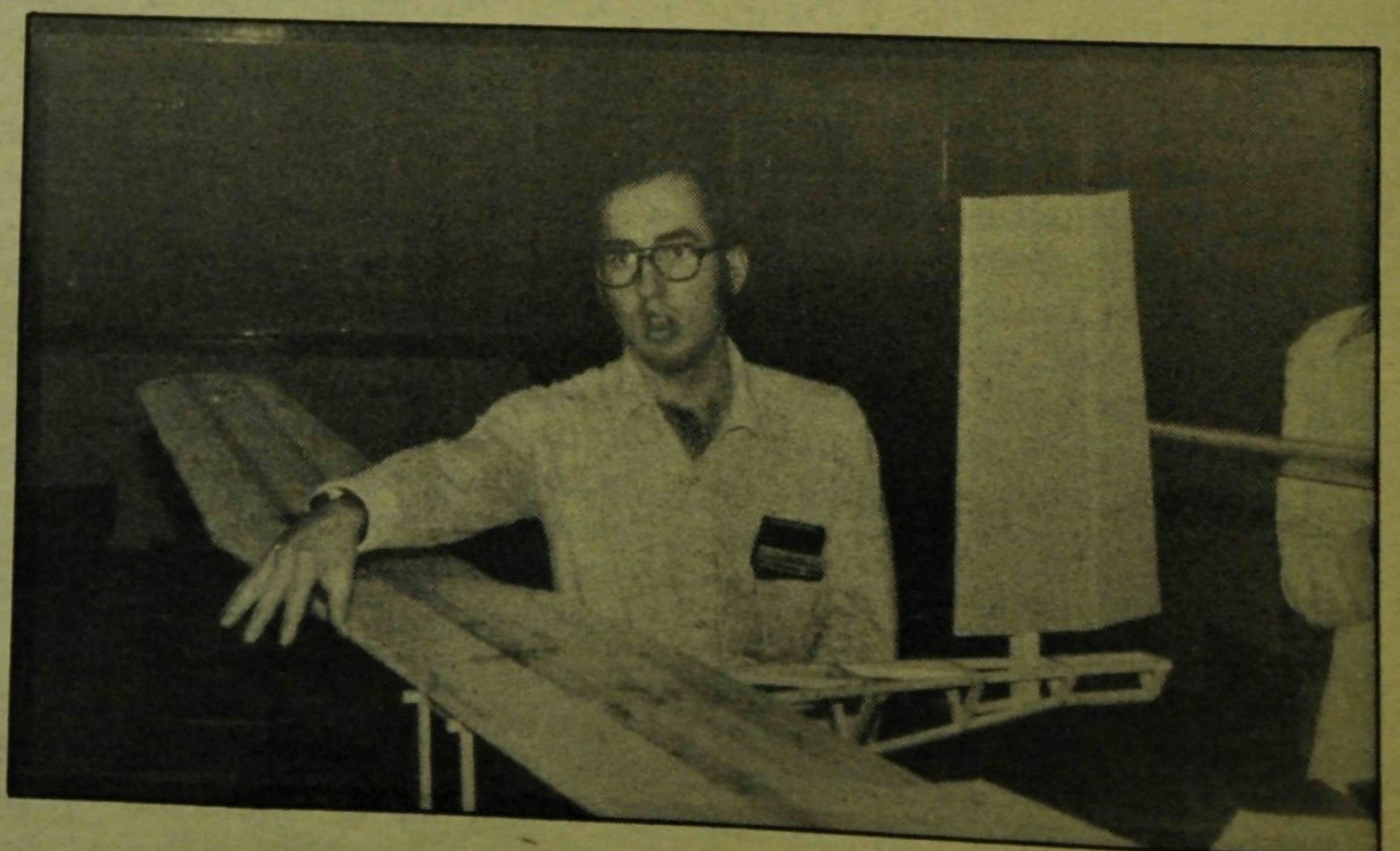
Distinguished scholarship is the primary requisite for admission into Tau Beta Pi. Those students of engineering whose scholarship places them in the highest one-eighth of the junior class or in the highest one-fifth of the senior class are further considered for membership on the basis of character, integrity, breadth of interest both inside and outside of engineering, adaptability, and unselfish activity.

On January 1, 1974, the Sigma Tau Fraternity merged with the Tau Beta Pi Association. Sigma Tau was founded in 1904 at the University of Nebraska as an engineering honor society. The basis of merger was the conviction

that a single, strong honor society would better serve the engineering profession. The resulting organization is Tau Beta Pi, unchanged in name, purpose, governance, operating procedure, and membership requirements. There are currently 165 active Tau Beta Pi chapters with a total membership of over 180,000.

The Illinois Alpha chapter of Tau Beta Pi was founded at the University of Illinois, Urbana-Champaign, on June 2, 1897. An active program of informing eligible members about Tau Beta Pi and encouraging them to join was undertaken during the fall semester. As a result, Tau Beta Pi has the potential to become an active society on campus and can draw on the talents of over 100 engineering students and alumni from many different backgrounds. Activities include a display at Open House, a field trip, and preparation of a booklet on how to efficiently use the engineering library.

High school students who want general information about Tau Beta Pi, undergraduates in any engineering department who need help with course work or class scheduling and advising, or Sigma Tau members who are interested in formally joining Tau Beta Pi should contact the Tau Beta Pi office, 300 Engineering Hall, Urbana, Illinois, 61801, or Kathy Davis at (217) 351-6042.



Many seniors in Aero Engineering work on senior design projects.

JOB OUTLOOK OPTIMISTIC

by Dean D. R. Opperman, Director of Engineering Placement

As this is being written in the last days of 1974, the economy is in a depressed state and unemployment is rising. The stock market continues to drop; and no one knows what to expect in 1975 as recession and inflation continue simultaneously. But there remains a very bright note in the whole confused economic picture for engineering students. All knowledgeable sources seem to agree with cautious optimism that 1975 will be a good year for engineering graduates, as will the remaining years of the 1970's.

Regardless of economic conditions, one thing is certain: retirements, resignations, and other turnovers will continue in the field of engineering, so that replacements will be necessary even though some industries may not be expanding in 1975. This, coupled with a decrease of approximately 5,000 engineering B.S. degree graduates, means that industry will not pass up the opportunity to add talented young engineers to their work force during 1975.

The energy problem will be a strong factor in the 1975 engineering market since the petroleum industry will be expanding all phases of their

operation in an effort to increase production. Industries concerned with nuclear power generation will also be expanding in an effort to meet increased demands. An interesting report, recently released by the National Science Foundation, estimates that 125,000 engineers will be needed over the next 15 years if we are to reduce our dependence on foreign energy sources to 9 percent of our total consumption. This is an average of 8,333 engineers per year just to work in the energy field. When one considers that the number of B.S. degrees awarded annually is dropping to just slightly above 30,000, it appears that approximately a quarter of our B.S. degree production will be used to combat the energy crisis.

Many other indicators also point to a reasonably good market for engineers during 1975. The UIUC Engineering Placement Office had, in early January, reservations for nearly as many companies to recruit on campus this spring as were here last spring. The current hiring rate of engineers in late 1974, in spite of the national unemployment rate approaching 7 percent, and with huge layoffs in the auto industry, was at the same rate as hiring in late 1973 before the downturn in the economy. A survey of 70 placement directors in December 1974 indicated that



An interview situation with student Jim Marconnet and Stan Avramidis from Ford Motor Co. is typical of the many interviews held on campus each year.

nearly half expected an increase in the number of companies to interview on their campuses. The same survey covered 111 company recruiters and 59 percent of them expected business in 1975 to be the same as or better than in 1974. As far as engineering is concerned, the depressed economy is a very selective phenomena.

The recent jump in engineering salaries reported by the Engineers Joint Council (EJC) is also an indication that there is no softness

in the market for engineering graduates receiving B.S., M.S., and Ph.D. degrees. The EJC surveyed companies employing a quarter of all practicing professional engineers so their data is quite reliable. The Engineering Placement Office data on this campus shows a similar trend. The increase in the average salary of Illinois B.S. degree recipients rose \$66 in six months from the May 1974 class to the December 1974 class. This is a 6.6 percent jump, which is rather considerable for such a short period of time.

The College Placement Council recently surveyed over 700 employers that they had surveyed the previous year also. The responses from this group indicate that their need for engineers at the bachelor's level is up 10 percent to 21,000. Their total engineering needs are for more than 25,000 engineering graduates. There are only a few more than 30,000 B.S. engineering graduates scheduled during 1975. If two-thirds of the output is needed by only 700 companies, the engineering shortage can be expected to continue.

There is little doubt that engineers will be in far more demand than graduates of social science and humanities programs. The anticipated need for 21,000 B.S. degrees next year is a significant fraction of all engineering degrees to be granted. On the other hand, the 20,000 anticipated positions for students in the humanities and social sciences comprise only about 4 percent of the total baccalaureate degrees expected to be granted in these curricula. However, these statistics alone are not sufficient reason to enter engineering if a student's aptitudes point toward the social sciences and humanities.

Another indication of the strength of the engineering market is the number of companies offering summer jobs in 1975. There has been no decrease from the number of companies offering summer jobs in 1974. In times of economic hardship, summer jobs can be eliminated quite easily when budgets are cut. The fact that they have not been significantly reduced for 1975 indicates that engineers are still in demand.

Con't. on Page 10

Black Society Is Helpful

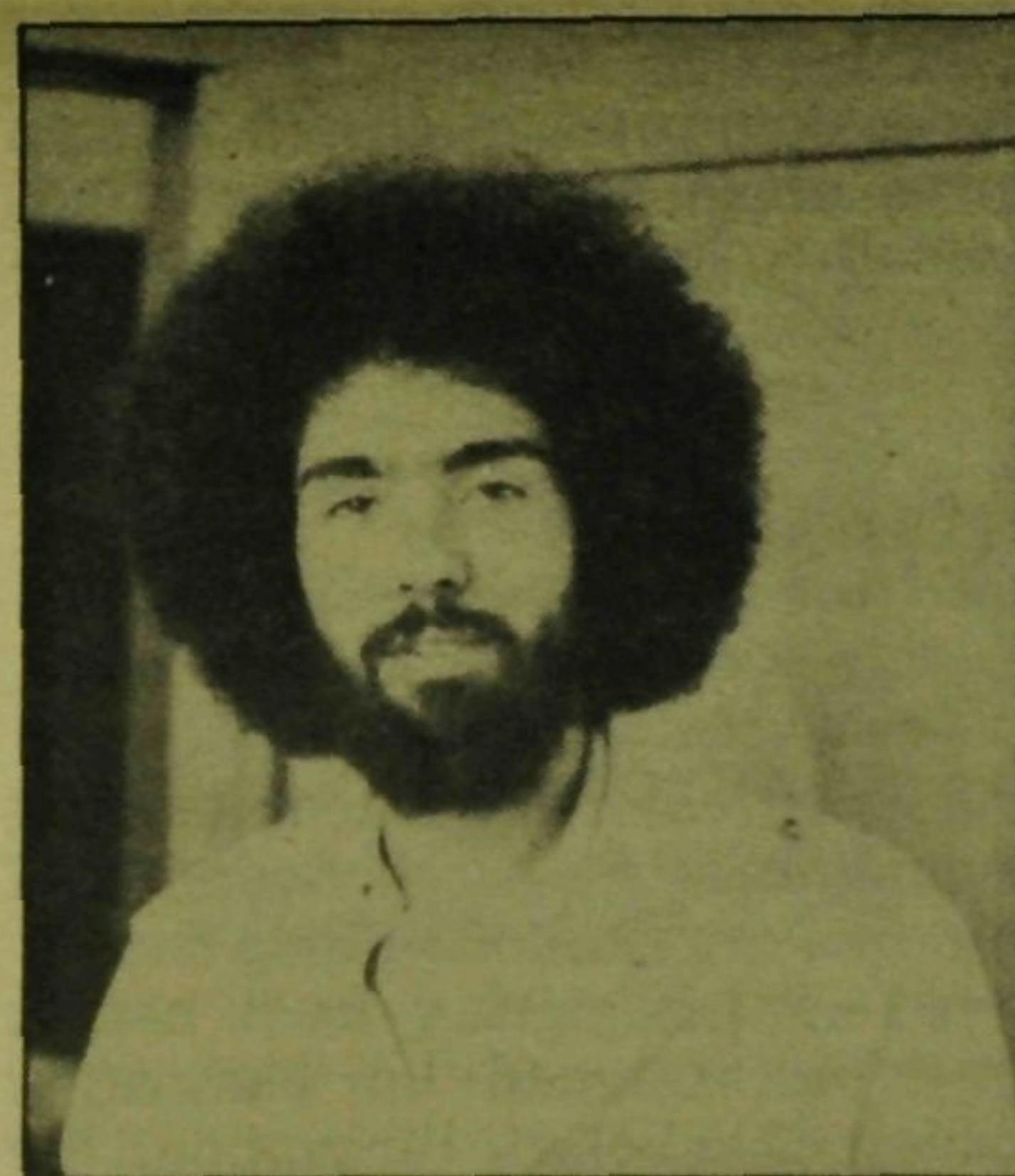
by Kim Caldwell, president BESA

The Black Engineering Student Association (BESA) was founded in 1971 by Rupert Graham Jr., for the purpose of establishing unity among black engineering students on the Champaign-Urbana campus of the University of Illinois. At that time, there were very few blacks enrolled in engineering at the Urbana campus, and those who were here found the academic life very rigorous. The blacks in engineering at that time needed some common ground, some means by which they could communicate effectively and help each other. Thus, the Black Engineering Student Association came into being.

The objectives of BESA center around familiarizing the black community with the many diversified aspects of engineering. BESA attempts to expose the community to engineering and at the same time to stimulate an interest in engineering. There is a lack of knowledge in the black community with regard to the extreme importance of engineering, indicated by the small number of black students who are receiving engineering degrees. Black engineers are needed because an increase in the number of black engineers will contribute to the economic independence of the black community and also to the much needed technical expertise. This will be achieved by channeling money into the community in the form of higher salaries.

In an effort to present engineering to the black community, BESA, in cooperation with the College of Engineering, coordinates an annual program which involves inviting black high school and junior college students to the Engineering Open House. In addition, the high school and junior college students are provided with transportation to and from the Open House. The activities include a tour of the engineering campus and exhibits with BESA members serving as guides, discussions with black engineering students and alumni, and also a discussion with admissions personnel in which points about high school preparation for engineering are brought out. The purpose of this program is not one of recruiting for the University of Illinois, but rather one of exposing the visiting student to the different fields of engineering. In the past three years, BESA has invited high schools from Chicago, East Saint Louis, Champaign-Urbana and several junior colleges in Chicago, establishing a total contact of approximately 1650 black students. This year the program is being continued with a special effort to establish a more personal relationship with visiting students.

In addition to the Open House program, BESA coordinates other services to black students who are currently enrolled in engineering at the University of Illinois. These include tutoring sessions, a file of old exams and notes, counseling, course and teacher evaluations, and a certain amount of exposure to summer jobs.



Kim Who? Kim Caldwell, of course. Kim is currently President of the Black Engineering Student Association.

Also of great benefit to engineering students on this campus is Dean Paul Parker. Dean Parker is a black, half-time dean who helps coordinate many of BESA's activities.

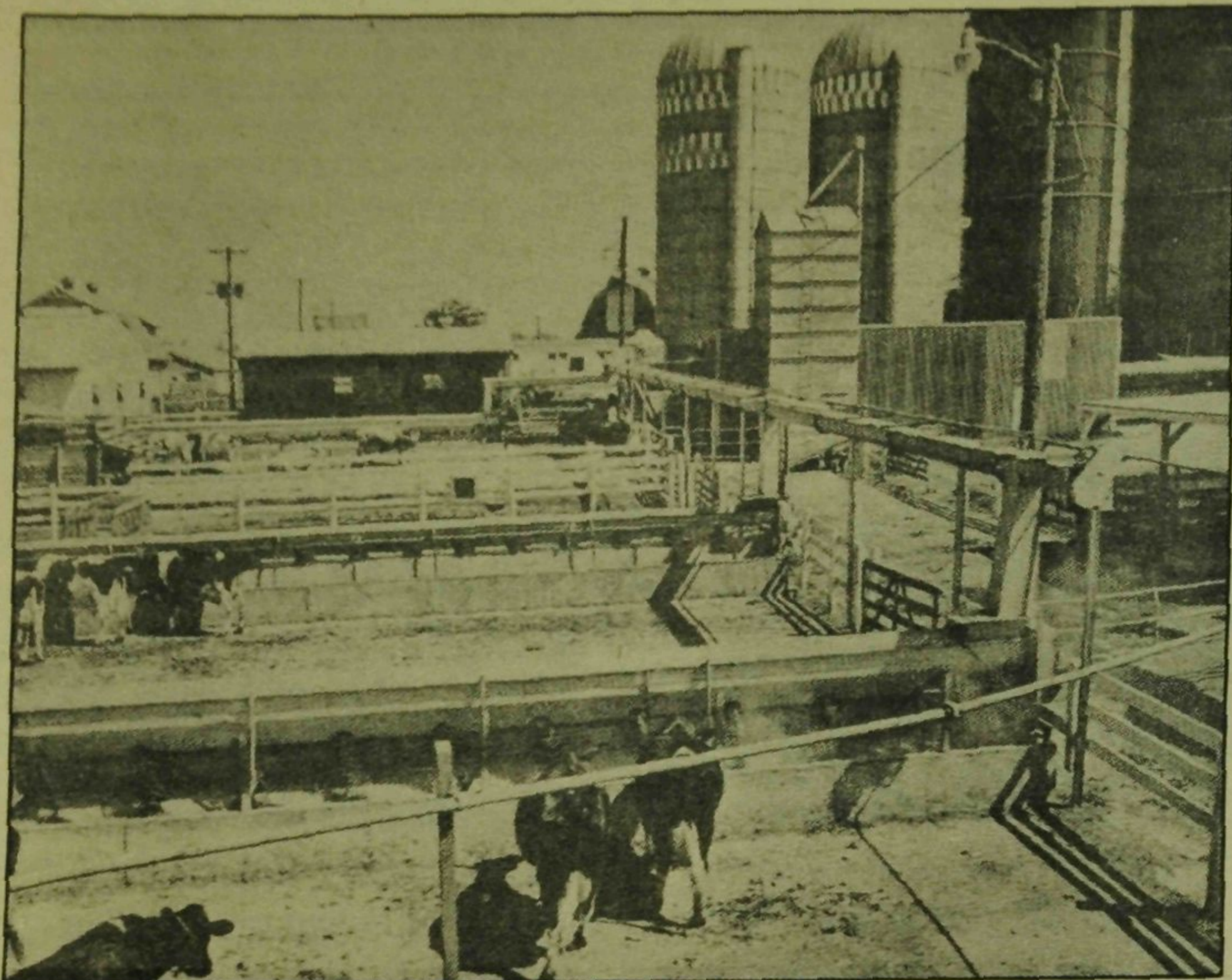
Thus, BESA's goals are to get blacks interested in engineering, and if they should decide to major in engineering at the University of Illinois, to provide services which will aid them in obtaining an engineering degree.

For suggestions or questions contact:

Mr. Kim Caldwell
302 Engineering Hall
Urbana, Illinois 61801
(217) 333-3558

or
Dean Paul Parker
207 Engineering Hall
Urbana, Illinois 61801
(217) 333-2280

AGRICULTURAL ENGINEERING



Dairy cows with similar daily energy requirements are fed automatically as a group by the dairy feeding system at the University of Illinois Dairy Science Farm. The ration is assembled automatically from the various storage bins and silos, weighed, and transported to each of five separate feed bunks.

Agricultural Engineering is that branch of the engineering profession concerned with supplying engineering man and woman power to the agricultural industry. This involves the production and marketing of food, feed and fiber. On the Urbana-Champaign Campus of the University of Illinois, the agricultural engineer has always been conceived as an individual well trained in the physical and engineering sciences; the thought being that the graduate, first of all,

must have academic training in accordance with established standards of the engineering profession. Exposure to the biological and agricultural sciences is provided for the purpose of giving the student an awareness of these disciplines and to enable him to intelligently call on subject matter specialists in these and other areas for assistance in solving problems. The agricultural engineer seldom works alone but most often finds himself a member of a team in-

volving highly trained professionals in such disciplines as plant breeding, agricultural soils, agricultural economics, plant pathology and plant and animal genetics.

The program of the Department consists of four major areas: resident teaching for both engineering and nonengineering students; research conducted through the Agricultural Experiment Station; public service and continuing education through the Cooperative Extension Service in Agriculture and the Campus Office on Continuing Education and Public Service; and international service under the auspices of the Office of International Programs in Agriculture. From a professional view, staff activities are mainly in four areas: field power units and implements; farm structures and environmental concerns; processing; and soil and water mechanics.

The agricultural engineering undergraduate student enrollment numbers approximately 80, although in recent times it has reached a maximum of about 140. The faculty-student ratio in the Department is approximately 1 to 2.5, and throughout all areas of the Department's program emphasis is placed on student welfare, development, and professional preparation.

A large number of undergraduates enroll in the eight semester program in the College of Engineering leading to the Bachelor of Science Degree in Agricultural Engineering. Others enter the Agricultural Science Curriculum, and after spending 3 to 4 academic years in the College of

Agriculture, transfer to the College of Engineering. The latter program leads to two baccalaureate degrees, one in agricultural engineering and another in agriculture.

Most undergraduates belong to the Illinois Student Branch, American Society of Agricultural Engineers. The branch usually selects a faculty advisor with primary responsibilities in research or with the cooperative extension service. The Student Branch has always taken an active part in Engineering Open House and faculty support of student projects is freely given. It is believed that the participation of research and extension academic staff personnel is especially effective in bringing recognition to efforts of the individual student as well as programs of the Branch. Over the past ten years the Branch has placed eight times either first, second, or third in the competition to name the most outstanding larger agricultural engineering student branch in the United States and Canada. In 1973 a junior agricultural engineering undergraduate was the recipient of the John G. Sutton Memorial Award, American Society of Agricultural Engineers, recognizing him as the most outstanding Agricultural Engineering student in the United States and Canada during that year at his class level.

Opportunities for student employment through undergraduate student traineeships in the Department are available. About two-thirds of the undergraduate student group hold part time jobs in the Department at some time during their undergraduate program and about one-half of this number depend on such employment for the completion of their degree programs. In addition, four scholarships of \$250 each are made available by the Department each year.

Employment opportunities following graduation are excellent and tend to remain strong over time. With the present emphasis on world food needs, the demand for agricultural engineers is becoming even stronger and already far exceeds the supply of well qualified individuals. This situation—demand exceeding supply—will surely become more critical.

Visitors to the Department always find a cordial welcome awaiting them. Staff members are proud of their Department and look forward to the opportunity of describing their particular activities to prospective students, parents, and others. Each year the student branch publishes the *Agrineer* which is essentially a year in the history of the Department as viewed through the eyes of small groups of undergraduates. Copies of the *Agrineer* are free upon request to the Department.

Come to see us—find out why Agricultural Engineering is truly the profession with a future.

Did You Know...?

The library of the University of Illinois, with more than seven million items, is the third largest university library in the United States, and the fourth largest university library in the world.

The U. of I. has the eighth largest full-time enrollment of any U. S. university.

Five graduates of the University have received the Nobel Prize while ten have received the Pulitzer Prize.

Graduates of the U. of I. include 31 presidents or chairmen of the board of the 500 largest corporations.

The Morrow Plots and Altgeld Hall are National Historic Landmarks. The Morrow Plots, first cultivated in 1876, represent the oldest soil testing plots in the U. S. Built in 1896, Altgeld Hall was originally the University Library and now houses the Mathematics Department.

Chartered in 1867, the University of Illinois opened March 2, 1868, with one building (known as "The Elephant"), three faculty members, and 50 male students.

The American Council on Education has rated the University of Illinois as the fourth best engineering school in the nation, based on the quality of graduate faculty.

The civil, chemical, electrical,

and mechanical engineering departments at the University of Illinois were ranked among the top seven in the nation in a recent American Council on Education survey of scholars throughout the nation.

Twelve members of the faculty have membership in the National Academy of Engineering.

The only person to receive two Nobel Prizes in the same field is a physicist at the University of Illinois. One prize was awarded in 1956 for the invention of the transistor; the second award came in 1972 for developing the theory of superconductivity.

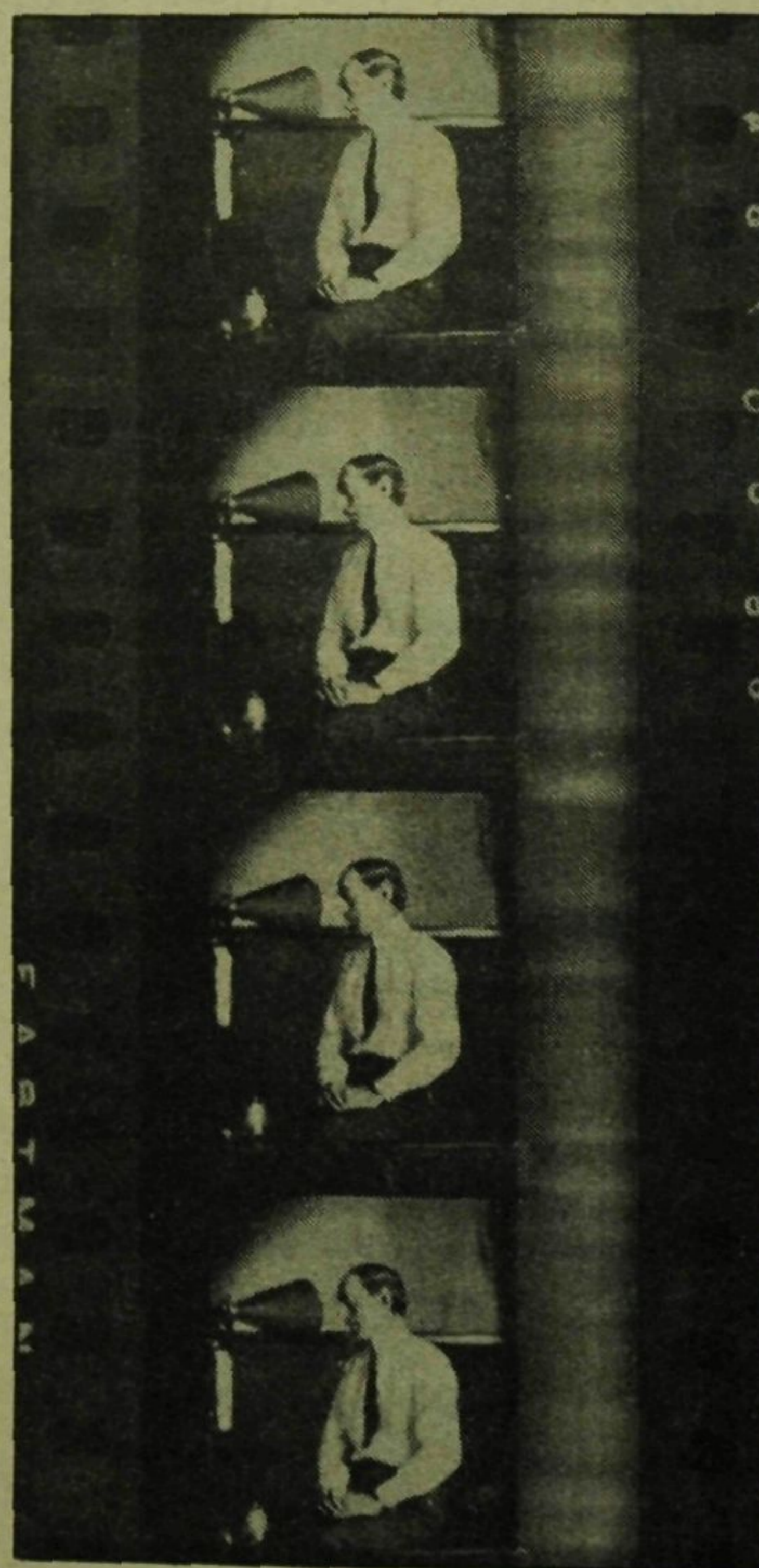
The modern photoelectric cell was developed by a U. of I. professor in 1913.

The first public demonstration of talking movies occurred at the University on June 9, 1922. The inventor was a research professor in electrical engineering.

PLATO, the world's most advanced computer for programmed learning, was developed at the University in the 1960's and is currently being expanded to include teaching facilities in junior colleges and secondary schools in Illinois.

In 1940 the first betatron for high energy physics was developed at the U. of I.

An element of most television



T. Tykociner a professor in electrical engineering, demonstrated the first "sound-on-film" movies at the University of Illinois in 1922.

sets, the log-periodic antenna, was developed at the U. of I. in 1961.

The U. of I. had the first homecoming as well as the first college cheerleader in the U. S.

.....
Freshman Petroleum Engineer—
"Isn't it great how these service station people know just where to set up their pumps to get gas?"
.....

CERAMIC ENGINEERING

Transferring?

by Matt Ferber

When I graduated from high school, I was definitely interested in an engineering career. However, I did not know what particular field to choose. I was a bit reluctant to attend a four year institution because I had heard rumors that freshmen were treated more like numbers than individuals. Likewise, many were supposedly "weeded out" by intentionally difficult courses in an attempt to allow only the top few to remain in college. For these reasons, I decided to attend a junior college and enroll in a pre-engineering program. I also hoped this would give me time to choose a particular field.

In two years it was time to transfer. I had decided that I wanted to go to the University of Illinois. However, I was still uncertain of what specific engineering area to enter. Previously, I heard a talk on ceramic engineering. I must admit that, at first, I thought that such engineers were doomed to make toilets or ashtrays the rest of their lives. It did not seem to be a very glamorous occupation. However, the more I heard, the more I realized that ceramic engineering was a vital field.

I decided to give ceramic engineering a try. Fortunately, I found that I had made a wise decision. In fact, all my previous fears about college (more specifically, the U. of I.) were completely unjustified. For example, in all of my ceramic courses, the student-teacher relationships were fairly good. Most professors made an attempt to learn the first names of each of their students, producing a more relaxed atmosphere in the class. As a result, the students could feel more at ease in asking questions on material they did not understand. These friendly relationships also existed outside of the classroom. For example, I found that many professors were willing to discuss a class matter or some other topic of mutual interest during their leisure time. In fact, students and professors often got together over a cold drink (not just water!) after meetings of the student branch of the American Ceramic Society.



Professors in the Ceramic Engineering Department demonstrate their teaching enthusiasm each morning before eight o'clock classes begin.



Juniors, seniors, graduates and alums of the Ceramics Department congregated in a glass tank during a field trip to the Owens-Illinois Glass Company in Streator, Illinois.

The small size of the Ceramic Department also offered some advantages. First, it was much easier for the professors to give time to their students who were having trouble understanding course material. Being a transfer student, I often found it was necessary to discuss such problems with my instructors. I might also add that they were usually very willing to give their time and attention. This was also true in laboratories. In one particular instance, a professor willingly stayed after lab hours to help a friend and myself with an experiment that was giving us trouble.

The smallness of the department also made it easy for me to get to know other students. Some professors helped by introducing me to other people. In any case, this was especially important to me since I was a transfer student and really did not know anyone.

Presently, I am a senior in Ceramic Engineering. I hope that my story has not led the reader to the conclusion that ceramic engineering is easy. On the contrary, I have found that it is a difficult curriculum. Fur-

thermore, the professors do not pamper the students but hand the responsibility for learning completely to them. However, the instructors are generally concerned with the individual student and, thus, are willing to give guidance (answering questions, handling problems, etc.) at almost any time.

If you are interested in ceramic engineering, I highly recommend that you visit our department. I am positive that you will find that the faculty and staff of the ceramic department are very helpful. I am also sure that you will not have to make one toilet bowl during your four years there.



Student Branch Is Active

by Larry Schulz, President SBACS

The Student Branch of the American Ceramic Society was created to enhance the educational process in the Ceramic arts and sciences. The Illinois Chapter plans activities each year that are designed to improve student-faculty relations, augment class work, or are just for fun.

Student branch is active in intramural sports and members can often be found celebrating Friday afternoon with a basketball game in one of the campus gyms. The Society sponsors one major fun event each semester. In the fall, the students and faculty visit a local park for a day of hot dogs, football games and liquid refreshment. Just before spring semester finals, the student branch provides an opportunity for the graduating seniors to get even with all the professors that rooked them during their studies. The "Pig Roast" is a

formal dinner and the seniors do the roasting. The only "pigs" available, however, are the profs and the most notorious is presented with the infamous PIG OF THE YEAR award in recognition of his dubious achievement in the classroom. All is forgiven, though, as the evening moves on.

Student branch holds monthly meetings. The meetings usually feature a guest speaker from industry. Sometimes the meetings feature a tour of the college electron microscope lab, learning about the machines that are capable of "seeing" individual layers of atoms. In the near future, the society will tour the nuclear reactor on campus.

Student Branch also plays a major role in the affairs of the Ceramic Engineering department. Several years ago it was instrumental in creating a student-faculty liaison committee to provide student feedback about curriculum and courses and to open an avenue

MS. CER E.

The Department of Ceramic Engineering was the first department in the College of Engineering to grant a degree to a woman. In 1921, between her sophomore and junior years, Carolyn Lindquist transferred to Ceramic Engineering from the College of Liberal Arts and Sciences and received her bachelor's degree in June, 1923.

Ceramic Engineering was also the first department in the College to grant advanced degrees to women. Harriet Reese Wisely received the first master's degree in 1947 and Esther Tuttle the first doctor's in 1948. Since that time two more women have earned master's and one a doctorate in this field.

Female graduates have found employment in their field. A questionnaire was sent to the ten degree-holders for whom an address could be found. All seven of those returning the form indicated that not only had they found a job as a ceramic engineer, but that they also felt their salaries and responsibilities were equal to those of their male counterparts. One did comment that she was not assigned the technicians nor permitted to attend the professional meetings that her male colleagues were. Three of the women retired from the profession, two to raise families and the third for other reasons. The latter later tried to return to her profession but found that although the material sounded familiar, her knowledge was no longer "at her finger's tip." Consequently, she accepted a position as a technician in microscopy and electrical measurements.

for the exchange of ideas. The society aids the department in preparing for Engineering Open house and in planning the annual plant trip to a glass factory.

The student branch, indeed, enhances the educational process in the ceramic arts and sciences, providing a mixture of recreation and knowledge not ordinarily supplied in the classroom.

CIVIL ENGINEERING

by Mitchell Brachman

In 1872 the Department of Civil Engineering graduated four students. Since then it has continued to maintain a high position among the best universities throughout the country. By the quality of its faculty, its educational programs, and by its major contributions, through

research, to engineering progress the department and its faculty have received many honors and awards. Every year distinguished faculty, many of them internationally known authorities in their field, receive research prizes, honors and awards from industry, societies, and the government. The American Council on Education in its recent reports recognized the

department as "distinguished," which virtually ties it for the top-ranking position among all departments in the country.

Civil Engineers are called upon to solve problems directly concerned with the well-being of mankind, in such varied areas as urban housing, construction technology, energy production and control, structural design and transportation.

The University of Illinois Civil Engineering Department teaches the skills necessary to become successful in such areas as air pollution, computer-aided design, construction structures, foundation, environmental engineering, highways, hydraulics, liquid-solid waste management, transportation, water-resources, nuclear engineering, soil and rock mechanics, and earthquake engineering.

The department maintains many modern research laboratories in several buildings including the C.E. Hydrosystems Laboratory Building. The Civil Engineering Department maintains fully equipped wood and metal shops and complete computer resources and testing facilities.

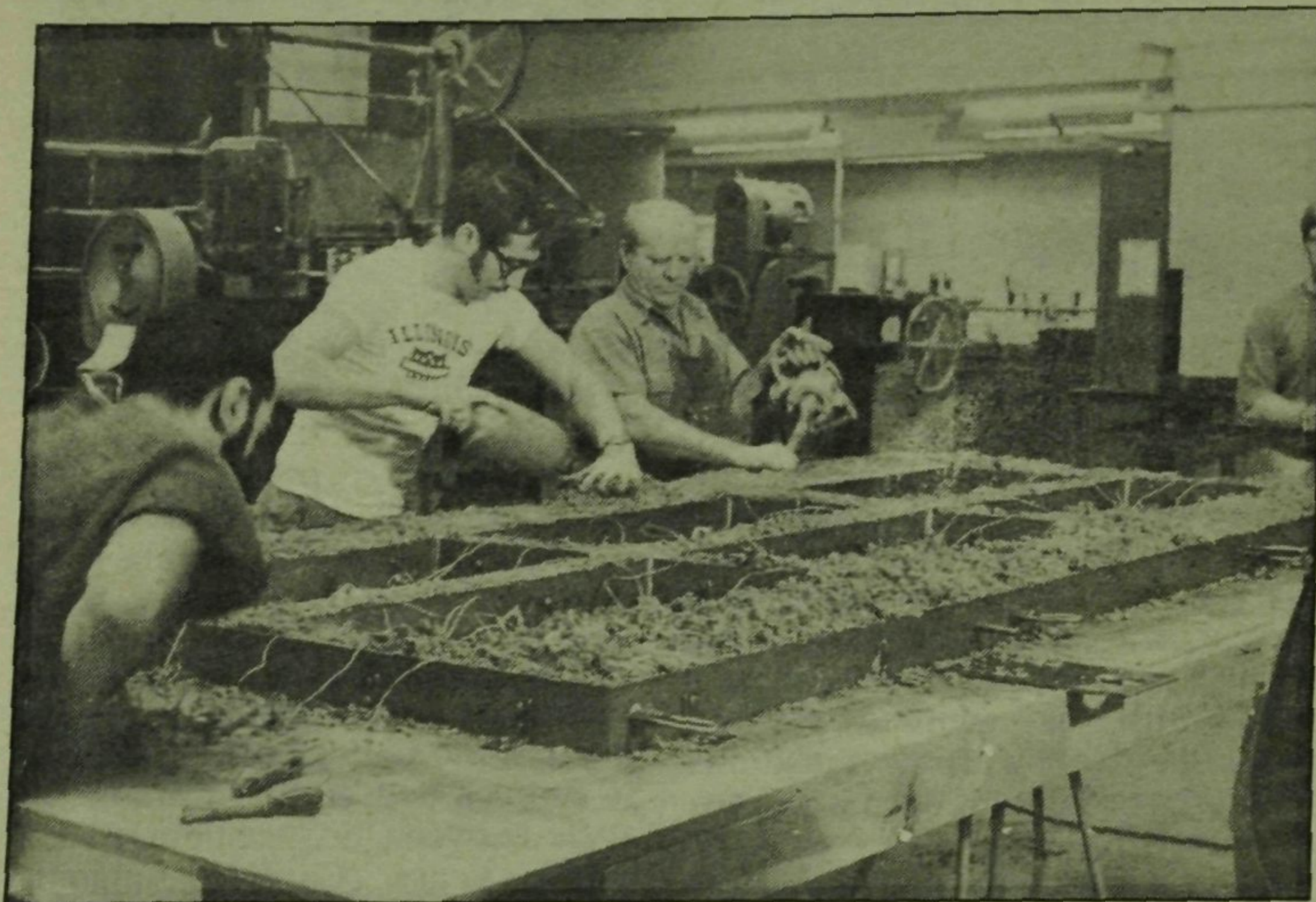
Research in the past year alone has resulted in over 90 publications concerning such varied projects as the conversion of sewage to

methane gas and the analysis of reinforced concrete bridges.

Chemical Engineering

The courses in chemical engineering, which are conducted by the Department of Chemistry and Chemical Engineering in the College of Liberal Arts and Sciences, prepare students to evaluate results obtained in the laboratory and to translate them into large-scale commercial processes, to improve existing plants, to develop new commercial products, to design new equipment, and to operate and supervise plants in which chemical processes take place. The curriculum offers a thorough training in the fundamental sciences of chemistry, mathematics, and physics, and their application to industry.

The chemical engineering laboratories are in the East Chemistry Building. The equipment in these laboratories is extensive and, in addition, other equipment of the Department of Chemistry and Chemical Engineering is available for the use of students in the curriculum in chemical engineering.



Students and shop personnel in Civil Engineering are casting concrete conduits that will be stressed to test tensile strength.

Engineering Council Represents Students

by Ken Grachan, President Engineering Council

Engineering Council is the student government in charge of representing the engineering students in all matters concerning their academic welfare. The Council has an advisory committee that deals directly with the deans of the college. Recommendations to the College Policy and Development Committee are also made by Council.

Each Professional Engineering Society has two representatives and each honorary society has one representative. To provide for more student input and involvement, students may also petition to be members-at-large and obtain voting privileges.

The Educational Affairs Committee of Engineering Council has one of the most important jobs in handling all academic affairs of Council. Most recently, this committee has arranged student trips to companies in Illinois and as far away as Tonawanda, New York. Often the companies pay part or all of the student's expenses. In addition, the committee has arranged for short courses to be held over semester break in areas such as welding, machine shop, small engine repair, sheet metal working, and a few flight refresher courses for those students interested in flying. The committee has also evaluated

several courses which resulted in significant changes to be made in course content and methods in teaching the course. Future projects include library improvements, solicitation of summer engineering jobs for students and continued evaluation of courses.

Council has three major projects that are directed toward the high school student. These are Engineering Open House (EOH), SITE (Student Introduction to Engineering) and Speaker's Bureau. Engineering Open House is held in the spring every year. Its purpose is to inform both students and the general public of the importance of engineering and to acquaint students and Council coordinates this effort.

The second program, SITE, is a program through which high school students have the chance to see the campus and tour the various departments and attend a few classes and laboratories. The students preregister through the mail using forms sent to their high schools by Council. On the day before Engineering Open House, these students arrive on campus in the morning and register. That afternoon are the tours and in the evening is a banquet. The deans of the College of Engineering and other prominent people in the college attend the banquet. Last year's speaker was Professor Donald Bitzer who developed

Plato, a visual display computer with terminals as far away as the Soviet Union.

Speaker's Bureau is a group of volunteer engineering students who return to their high schools and talk to students about engineering, college life, and the University of Illinois. Over 100 high schools and junior colleges in the state were visited this year.

Engineering Council also sponsors social events such as an annual basketball tournament with over twenty society and independent teams participating. The biggest social event of the year is St. Pat's Ball, a semi-formal dance which received its name from the patron saint of engineers, St. Patrick, and which is held on or around St. Patrick's day. Engineering Open House is also held at this time and the dance is an enjoyable and fitting ending to a very busy weekend. This year's dance is being held at the Ramada Inn and includes a dinner before the dance.

In addition to the above programs and events, Engineering Council recognizes achievements in student activities, teaching excellence and improvement of student-teacher relations. Each year Council selects 10-15 students who have shown high leadership qualities in student activities on campus and grants them the honor of becoming one of the Knights of St. Pat. Academic success is not a

major requirement; students on probation, however, are not eligible. The Everitt Award is given to two outstanding teachers as determined by both student nominations and faculty recommendations. Selection procedures are rigid in order to insure that the best candidates are chosen. The Pierce Award goes to one student and one teacher who have encouraged and helped develop better relations between students and faculty within the college. The award recipients are chosen on the basis of student nomination and letters of recommendation from both students and faculty.

This year, Engineering Council has broadened its scope to become involved in campus wide affairs and student government. Council will continue this effort and search for new and better ways to help the engineering students on this campus.

Finally, Engineering Council hopes to expand and improve our programs for high school students in order to make them more aware of what engineering is and what it is like at the University of Illinois. Council also hopes those high school students who have taken advantage of these programs will spread the word, encouraging others to participate. Those of you who become engineering students on this campus are encouraged to help in whatever way you can with the activities of Engineering Council.

Computer Science

Computer Science is a broad discipline, covering logic design, hardware, theory of computation, numerical analysis, programming, and computer application.

The Department of Computer Science (DCS) at the University of Illinois is and has always been a leader in the field. DCS is one of a small number of university groups which engaged, from the early (but hardly distant) days of automatic computation, in the design of complete systems, hardware as well as software. The many current research programs in DCS cover a wide range of topics within the field of Computer Science.

Research in Computer Science

The Digital Computer Laboratory at the University of Illinois was originally founded as a research group, and research remains one of the primary functions of the Department of Computer Science. Historically and currently, the department has been one of the leaders in the world in computer research. ILLIAC I, built in 1952 on the U of I campus, was one of the first electronic computers built and owned entirely by an educational institution. In 1957, plans were developed for ILLIAC II, which would be 100 times faster than ILLIAC I and ten times faster than any other computer then in existence. In the next five years, the machine was designed, built, and tested at the U of I campus. In 1963, ILLIAC II ran at capacity for the first time; and in 1966 it was operated on a time-shared basis. In

number of laboratory and university reports and also programming manuals.

The various research groups of the Department of Computer Science have equipment and facilities available to the faculty and students of the Department for research use. There are shop facilities with complete installations to produce printed circuits and about \$500,000 worth of test equipment within the Hardware Research Group. There is a new, improved elementary logic laboratory, called EXCEL, which was developed at the University.

an unconventional computer design, basically a vector or array processor, which, when completed, will be able to operate at speeds of approximately 200 million instructions per second. And ILLIAC IV was designed especially to solve large problems where speed is of the essence and the same algorithm is performed repeatedly. Users of ILLIAC IV will also heavily access a trillion bit (1,000,000,000,000) mass storage system (laser memory data computer) to aid them in preparing and processing massive amounts of data.

360-75 was coupled to the 360-50. The IBM 360-50 acted as a housekeeper, secretary, and bookkeeper to the IBM 360-75, coordinating remote job entry consoles and batch-processed jobs which were fed into the System 360-75 for computation. Later, in 1968, the System 360-50 was returned, for budgetary reasons, and with the development of increasingly efficient software, the System 360-75 was soon able to handle and at times exceed the job load previously processed by the 50-75 complex.

During the next few years, several studies of campus computing identified general problems in the function and growth of the central computing service. Among these problems were: the provision of increased access to the computer through terminals, the potential problems of coordination of central services with that provided by special purpose dedicated computer facilities, and the need for long range planning. The creation of the Computing Services Office, located in the Digital Computer Laboratory, in 1971 was a response to these identified problems.

Members of more than 100 University departments and over 8,000 students, a quarter of the University enrollment, a year use CSO computers in problems ranging from studies of schizophrenic behavior to generation of new musical systems.



Using the keypunch is a common pastime with all Computer Science Students. They punch their programs on cards and submit them to be run on the computer.

Also available is a read-write microprogrammable machine and peripherals for the study of file processing and information retrieval.

ARPAnet, ILLIAC IV, and CAC

It became apparent in the mid 60's with the explosive growth and variety of computer systems and services being developed in this country, that some means would have to be found to couple computer systems and computer users together so that unique features at various locations could be used by people at different locations. An experiment to this end was initiated by the Advanced Research Projects Agency of the Department of Defense and is called the ARPAnet, or ARPAnet. The ARPAnet connects, via high speed transmissions lines, forty ARPA research centers and projects located all about the continental United States, Canada, Hawaii, and London.

The network itself is a full duplex high-speed (50,000 bits per second) data transmission network. The design and implementation of the network has produced an ultra-high level of reliability (currently no more than one single bit error per year should go undetected). At any given location in the network, one or more HOST computers may be attached providing a service center or research project with access to the ARPAnet. The connection between HOSTs is made over a high-speed interface at 100,000 bits per second. Typical HOST computers in use around the network are the DEC PDP-10, Multice, IBM 360-91, IBM 360-67, and Burroughs B6700.

Early last year, ILLIAC IV joined the ARPAnet to provide a unique service site. ILLIAC IV is

The Center for Advanced Computation in the Graduate College of the University of Illinois at Urbana-Champaign was created early in the academic year 1970-71 to conduct applied research and provide services to the academic community and the state and federal governments. The Center encourages inter-disciplinary research, promotes applied research, and supports the development of computer technology which will contribute to the solution of problems of importance to society.

The Center for Advanced Computation is an outgrowth of the ILLIAC IV Project which was initiated in 1965. ILLIAC IV remains a principal resource and focus for Center research, although only a portion of the Center's programs are directly related to it. Computing Services Office (CSO)

In 1952 ILLIAC I went into operation as a computing facility for the University. Its initial schedule of eight-hour a day operation was gradually expanded to meet a growing need for computer service to 24 hours a day, six days a week. By 1959, when even this timetable was inadequate, the Department of Computer Science acquired an IBM 650 to enlarge its service capabilities. In August, 1962, the IBM 650 was replaced by an IBM 7090-1401 system, and later in the year the ILLIAC I was removed from service. In 1963, ILLIAC II was added to the department's service complement, and the 7090 was upgraded to a 7094. Thus, in ten years the capacity of the University's computing facilities had been increased by a factor of 100.

Five years later, in July 1967, an IBM system 360-50 was acquired. In December, 1967, an IBM System



An enthusiastic computer engineering student sends instructions to the microdata computer via a teletype.

1963, a pattern recognition computer study became the ILLIAC III project at the U of I. IN 1965, the Department of Computer Science embarked on a project to produce a new computer, ILLIAC IV, which would be by far the largest and fastest in the world.

To support the research, the U of I operates and maintains facilities on a campus-wide basis which are available to members of all departments within the University. The Department of Computer Science Library maintains an exhaustive collection of journals and books covering the area of computer science and related areas, particularly mathematics and electrical engineering, augmented by a



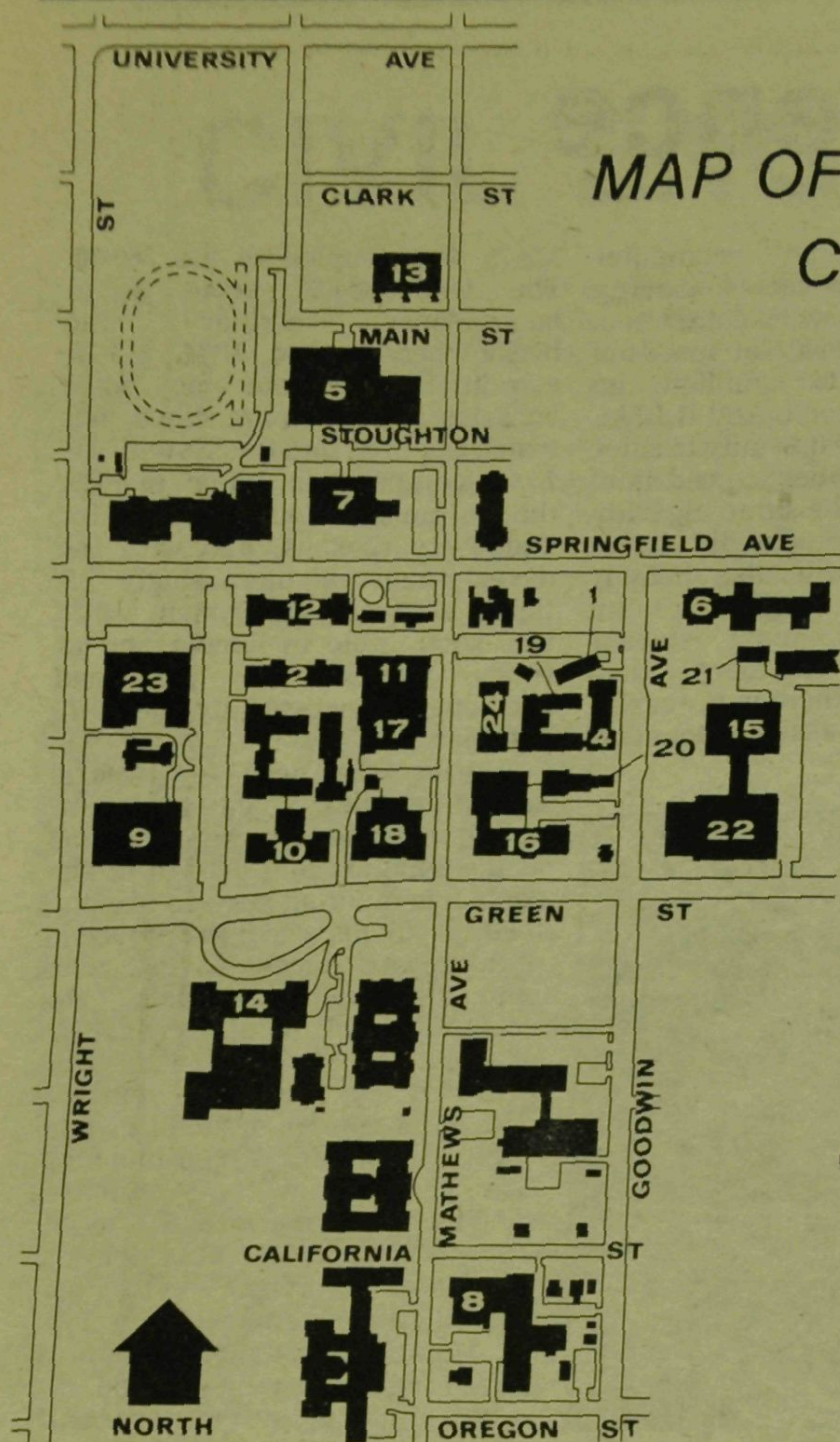
This PDP-8 computer facility housed at the Digital Computer Laboratory is one of many at the U of I.

by Pat Michel, President

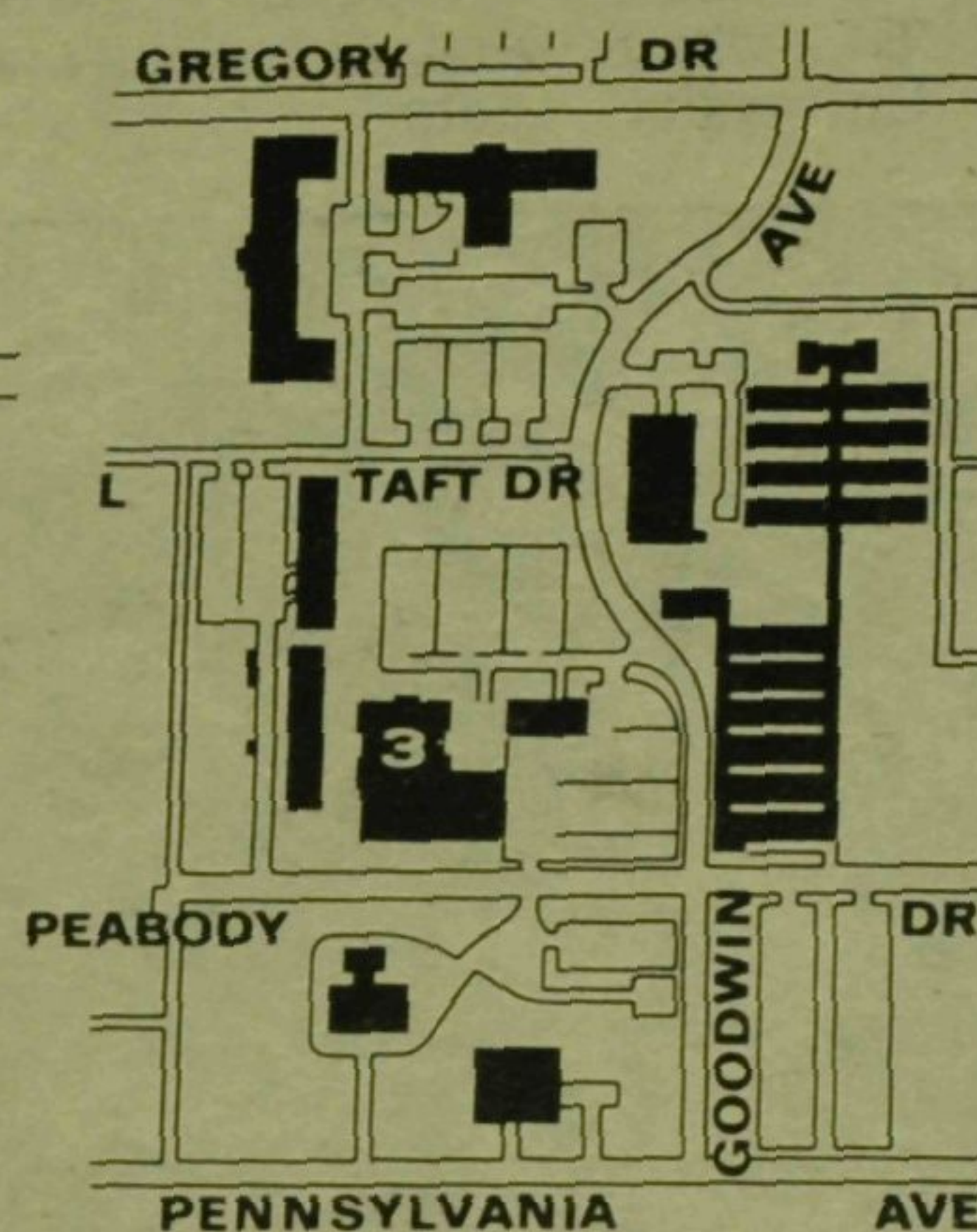
The Student Chapter of the American Institute of Chemical Engineers is the sole organization on campus promoting student interest in the chemical engineering profession.

Each year, A.I.Ch.E. sponsors a number of plant trips and speakers programs of interest to students. Last fall, A.I.Ch.E. sponsored a graduate school discussion program focusing on the advantages and disadvantages of advanced degrees in chemical engineering.

This semester, A.I.Ch.E. plans to offer more of these programs and hopes to initiate new activities such as a freshman luncheon, peer advising for technical electives, and a senior graduation dinner and honors recognition.



MAP OF ENGINEERING CAMPUS



To reach area shown in insert go south on Goodwin Ave

Bus Tours

.....Bus Routes

★Bus Stops

Buses will go to Willard Airport on Saturday only.

Emergency Numbers

Emergency Police or Ambulance 1-1-1
University Police 333-1212
University Fire Dept. 333-2424
First Aid 333-2700
There will also be a First Aid Station in Engineering Hall.

- | | |
|------------------------------|--------------------------------|
| 1. Aeronautical Lab A | 12. Foundry |
| 2. Aeronautical Lab B | 13. Hydrosystems Lab |
| 3. Agricultural Eng Bldg | 14. Illini Union |
| 4. Ceramics Bldg | 15. Materials Research Lab |
| 5. Civil Eng Bldg | 16. Mechanical Eng Bldg |
| 6. Coordinated Science Lab | 17. Mechanical Eng Lab |
| 7. Digital Computer Lab | 18. Mining and Metallurgy Bldg |
| 8. East Chemistry Bldg | 19. Nuclear Eng Lab |
| 9. Electrical Eng Bldg | 20. Nuclear Radiation Lab |
| 10. Engineering Hall | 21. Nuclear Reactor Lab |
| 11. Engineering Research Lab | 22. Physics Bldg |
| | 23. Talbot Lab |
| | 24. Transportation Bldg |

ENGINEERING OPEN HOUSE EXHIBITS

Aeronautical & Astronautical Engineering - Aeor Lab B

Space Shuttle
Analog Computer
Magentohydrodynamics
Plato
Windmill and Solor Energy Structures
1-Dimensional Supersonic Nozzle/
Low Speed Wind Tunnel
Aerospace Photographs
Film Boiling
Schlieren and Shadowgraph
Demonstration
Water Table
Glider
Aerodynamic Demonstrations
Ramjet
Radio-Controlled Airplane
Rocket Engine Display
High-Lift Airfoil
HP-65 Calculator Demonstration
Rockey
To Jupiter and Beyond - A
Simulation of the Grand Tour
Movies

Agricultural Engineering - Agricultural Engineering Bldg.

Soil and Water
Power and Machinery
Processing
Farm Structures.
Ceramic Engineering - Ceramics Bldg.
Porcelain Enameling
Strength Demonstration
Glass Making
Pyrometry
Tempered Glass, Fiber Optics, and Glass-Ceramics
Bioceramics
Electrical Ceramics
Refractories
Slide Show

Phase Transformation - BaTiO₃ Chemical Engineering - Roger Adam's Lab

Civil Engineering
Transportation - 4th floor Eng. Hall
Environmental - 4th Floor Civil Engr. Bldg.
Structural - Crane Bay, Civil Engr. Bldg.
Surveying - Track Area South of Baseball Diamond
Construction - 1st floor and Crane Bay - CEB
Miscellaneous - Crane Bay CEB
Computer Science - Digital Computer Lab
DEC-10 Software Demonstration
PDP-8 Spacewar
PDP-11 Poster Printing
Tour of the IBM 360
Logic-Lab projects
Graduate Research Projects
Slide Show

Electrical Engineering - Electrical Engineering Bldg.

Digital and Electronic Clocks
Tesla Coil and Jacob's Ladder
Electrostatics
Weather Satellite Picture Reception
TV Ping Pong and Pawn Game
Floating Frying Pan
Undergraduate Micro Electronics Lab
Microwave Lab
Microcomputer
Proximity Detector- Burglar System - Eta Kappa Nu
4-Channel music with Synthesizer
Color Organs and Coordinated Light Display
Optical Transmission
Class D Linear Amplifier

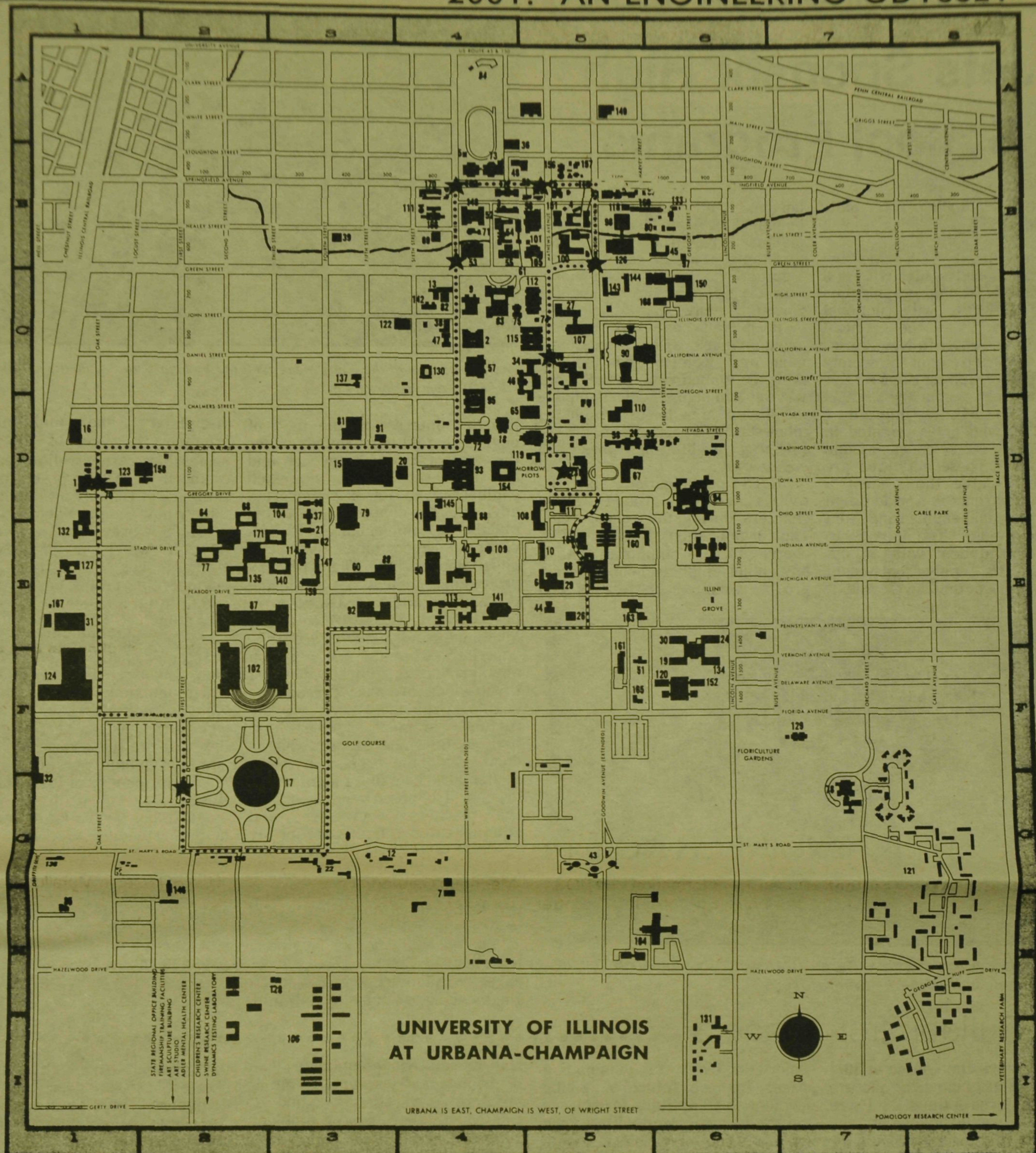
Magnetic Cannon General Engineering - Transportation Bldg.

Design courses GE 242/GE 104
Curriculum Display
Jets Program
Engineering History and Law
Analog Computer
Movies
Hospitality Room
Electron Microscope Center - Basement Bevier Hall
Scanning electron Microscope
Transmission Electron Microscope
Institute of Aviation - Willard Airport
Tours of training classrooms, labs, and training aids
Airplane Rides
Mechanical and Industrial Engineering - Mechanical Engineering Bldg.
Vortex Tube
Casting Demonstrations - Foundry
Inertia Welding
Combustion of Coal Dust
Vehicle Dynamics
Can and Follower Experiment
Cryogenics
Man and his Environment
Internal Combustion Engine Demonstrations
Tensile Testing of Aluminum Specimens
Electric Pollution Free Car
Frictionless Ball Bearing
Demonstration of Metal Cutting
Plus 10 Bizarre Mechanisms

Metallurgical and Mining Engineering - Metallurgy and Mining Bldg.
Metal Fabrication
Strength of Metals

Use of Laser in Metallurgy

Space Welding
Corrosion of Metals
Metallurgy Magic
Union Carbide Exhibit
Nuclear Engineering - Nuclear Reactor Lab
Ping Pong Ball Reactor
Plasma Demonstration
Films
Nuclear Reactor Tour
Physics - Physics Bldg.
Astrophysics
Superconductivity
Holography
Rutherford Scattering
Ion Microscope
Lazer Modulation
Spark Chamber
Two-Slit Interference
Plasma Pinch
Lecture Demonstrations
PLATO Demonstration
Wailing Wall
Theoretical and Applied Mechanics - Talbot Lab
Fluid Mechanics and Hydraulics
Photomechanics
Material Testing
Fatigue and Fracture
Dynamics and Wave Motion
3,000,000 Lb. Testing Machine
Computerized Material Testing Equipment
University High School - In Electrical Engineering Bldg.
Electronic Motorized Toys
Digital Metronome
Alarm Device
Robe Goldberg Device
Electronic Calculators
Electronic Piano
Mouse Activity Measurements
Household Electronic Secretary



UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

URBANA IS EAST, CHAMPAIGN IS WEST, OF WRIGHT STREET

1	Abbott Power Plant	D-1
2	Adler Mental Health Center	I-2
3	Administration Building	C-4
4	Advanced Computation Building	B-5
5	Advanced Study Center for 912 W. Illinois St.	C-6
6	Aeronautical Engineering Laboratory B	B-4
7	Aeronautical Engineering Laboratory A	B-5
8	Aeronomy Laboratory	B-4
9	Agricultural Engineering Building and Agricultural Engineering Research Laboratory	E-5
10	Agricultural Service Building	H-4
11	Allen, Louise C., Residence Hall	D-6
12	Alpha House, 1207 W. Springfield Ave.	B-3
13	Altgeld Hall	C-4
14	Animal Genetics Building	E-5
15	Animal Sciences Laboratory	D-5
16	Animal Science Barns (St. Mary's Road)	G-3
17	Art Building	C-4
18	Architecture Building	E-4
19	Armory	D-3
20	Armory Avenue Warehouse	D-1
21	Art Sculpture Building	I-2
22	Assembly Hall	G-2
23	Auditorium	D-4
24	Babcock Hall	F-6
25	Band Building	D-4
26	Barton Hall	E-3
27	Beef Cattle Barn (St. Mary's Road)	G-3
28	Bevier Hall—Home Economics	D-5
29	Biological Control Laboratory	H-1
30	Blaisdell Hall	E-6
31	Botany Annex and Greenhouse	B-5
32	Burnside Research Laboratory	E-5
33	Burrill Hall	C-5
34	Bussey, Mary E., Residence Hall	D-5
35	Car Pool Garage	E-5
36	Central Food Stores Building	E-6
37	Central Receiving Warehouse	F-1
38	Ceramics Building	B-5
39	Chemistry Annex	C-5
40	Child Development Laboratory—Home Economics	D-6
41	Children's Research Center	I-2
42	Civil Engineering Building	A-4
43	Clark Hall	D-3
44	Cable Hall	C-4
45	Colwell Wolfe School	B-3
46	Commerce Annex	E-4
47	Commerce Building, West of 1202 W. California Ave.	C-5
48	Coordinated Science Laboratory	B-5
49	Dairy Cattle Barns (St. Mary's Road)	G-3
50	Dairy Manufactures Building	E-5
51	Daniels Hall	B-6
52	Davenport Hall	C-5
53	Davenport House	C-4

54	David Kinley Hall	D-4
55	Delta House, 903 W. Nevada St.	D-6
56	Digital Computer Laboratory	B-4
57	Dynamics Testing Laboratory	I-2
58	Education Building	E-4
59	Educational Projects and Guidance Building	F-5
60	Educational Research Projects, 805 W. Pennsylvania Ave.	E-6
61	Electrical Engineering Annex	B-4
62	Electrical Engineering Building	B-4
63	Electrical Engineering Research Laboratory	B-4
64	Engineering Hall	B-4
65	Engineering Research Laboratory	B-5
66	English Building	C-4
67	Evans, Laura B., Residence Hall	D-5
68	Filtration Plant	B-5
69	Fine and Applied Arts Building	E-3
70	Fire Station	B-4
71	Firearm Training Facilities	I-1
72	Florida Avenue Warehouse	E-5
73	Floriculture Building	F-6
74	Floriculture Gardens	F-6
75	Florida Avenue Residence Halls	F-6
76	Forbes Hall	E-2
77	Foreign Languages Building	D-5
78	Forest Science Laboratory	E-5
79	Fourth Street Residence Halls	E-3
80	Frear Gymnasium	D-5
81	French House, 901 S. Lincoln Ave.	D-6
82	Gamma House, 307 E. Daniel St.	C-3
83	Garner Hall	D-2
84	Geosense Electronics Laboratory	B-4
85	Geological Survey Research Laboratory	D-1
86	Golf Course	F-3
87	Government and Public Affairs, Institute of, 1201 W. Nevada St.	D-5
88	Graduate Studio for Painting, 26 E. Springfield Ave.	B-1
89	Greenhouse, North	B-4
90	Gregory Drive Residence Halls	D-2
91	Gregory Hall	D-4
92	Gymnasium Annex	B-4
93	Halfway House	C-5
94	Marker Hall	C-4
95	Health Center	E-6
96	Hill Annex, 1204 W. Nevada St.	D-5
97	Honors Programs, 1205 W. Oregon St.	C-5
98	Hopkins Hall	E-2
99	Horticulture Field Laboratory	G-7
100	Huff, George, Gymnasium	D-3
101	Hydraulic Engineering Laboratory A	B-6
102	Hydrostatics Laboratory	A-5
103	Ice Skating Rink	D-3
104	Illini Grove	E-6
105	Illini Hall	C-4
106	Illini Union Building	C-4

107	Illinois Field	A-4
108	Illinois Street Residence Halls	C-6
109	Institutional Research, Bureau of	B-5
110	Intramural-Physical Education Building	E-2
111	Kranert Art Museum	E-3
112	Kranert Art Museum for the Performing Arts	C-5
113	Law and Industrial Relations Building	D-3
114	Law Building	E-3
115	Levin Faculty Center	C-6
116	Library	D-4
117	Lincoln Avenue Residence	D-6
118	Lincoln Hall	D-4
119	Lundgren Hall	D-3
120	Mailing Center	B-6
121	Materials Research Laboratory	B-5
122	McKinley Hospital	E-6
123	Mechanical Engineering Building	B-5
124	Mechanical Engineering Laboratory	B-5
125	Memorial Stadium	F-2
126	Men's Old Gymnasium	B-4
127	Men's Residence Halls, Post Office and Snack Bar	D-3
128	Metallurgy and Mining Building	B-5
129	Moorman Animal Breeding Research Farm	I-3
130	Morrill, Justin Smith, Hall	C-5
131	Morrow Plots	D-5
132	Motion Picture Production Center	B-4
133	Mumford House	D-5
134	Music Building	D-5
135	National Council of Teachers of English	B-4
136	Natural History Building	C-5
137	Natural Resources Building	E-4
138	Noble Hall	E-3
139	Noyes, William Albert, Laboratory of Chemistry	C-5
140	Nuclear Engineering Laboratory	B-5
141	Nuclear Radiation Laboratory (Cyclotron)	B-5
142	Nuclear Reactor Laboratory	B-5
143	Observatory	D-5
144	Oglesby Hall	F-6
145	Orchard Apartments	G-8
146	Parking Structure	C-4
147	Peabody Drive Residence Halls	E-2
148	Personality Assessment and Group Analysis Laboratory, 907 S. Sixth St.	C-4
149	Pennsylvania Avenue Residence Halls	E-6
150	Personnel Services Building	D-1
151	Physical Plant Service Building	F-1
152	Physical Plant Service Building Annex	B-5
153	Physics Building	B-5
154	Physics Research Laboratory (Belatron)	E-1
155	Physiology Research Laboratory	H-2
156	Pomology Research Center	J-8
157	Practice Annex, 1205 1/2 W. Nevada St.	D-5
158	President's House	F-7
159	Psychology Building	C-4
160	Purebred Dairy Barns (South Lincoln Avenue)	I-6
161	Rehabilitation-Education Center	E-1
162	Roger Adams Laboratory	C-5

163	Environmental Research Laboratory	B-6
164	Saunders Hall	F-6
165	Scott Hall	E-2
166	Sheep Barn (St. Mary's Road)	G-2
167	Sherman Hall	C-3
168	Small Homes Council—Building Research Council Building	G-1
169	Smith Memorial Music Hall	D-5
170	Snyder Hall	E-3
171	Social Work, Jane Addams Graduate School of, 1207 W. Oregon St.	C-5
172	Speech and Hearing Clinic, 601 E. John St.	C-4
173	Stadium, Memorial	F-2
174	State Regional Office Building	I-2
175	State Universities Retirement System, 50 E. Gerry Dr.	I-2
176	Stenographic Service, 1203 W. Oregon St.	C-5
177	Steven House, 708 S. Mathews Ave.	C-5
178	Stock Judging Pavilion	E-4
179	String Annex, 1205 W. Nevada St.	D-5
180	Student Services Building	C-4
181	Student-Staff Apartments, Goodwin Avenue	C-5
182	Student-Staff Apartments, Green Street	C-5
183	Surveying Building	H-4
184	Swine Barn (South First Street Road)	H-2
185	Swine Research Center	I-2
186	Taft Hall	D-5
187	Talbot, Arthur Newell, Laboratory	B-4
188	Television Building	A-5
189	Theory Annex, 608 S. Mathews Ave.	C-5
190	Townsend Hall	C-6
191	Transportation Building	B-5
192	Triforce Hall	F-6
193	Turner, Jonathan Baldwin, Hall	E-5
194	Undergraduate Library	B-4
195	University Civil Service System of Illinois, 1205 W. California Ave.	C-5
196	University High School	B-5
197	University High School Gymnasium	B-5
198	University Press Building	B-2
199	Van Doren Hall	E-3
200	Vegetable Crops Building	E-5
201	Veterinary Clinic, Large Animal	F-3
202	Veterinary Medicine Building	F-5
203	Veterinary Medicine Hospital and Clinic, Small Animal	H-5
204	Veterinary Medicine Research Laboratory	F-5
205	Veterinary Research Farm	I-8
206	Visual Aids Service Building	E-1
207	Vivarium	B-4
208	Walsh Storage Building	E-1
209	Wardell Hall	C-6
210	Warehouse	B-5
211	Water Resources Building	B-4
212	Weston Hall	E-3
213	Woodshop and Foundry	B-4
214	World Heritage Museum	D-4

Jets Sponsor High School Programs

by David C. O'Bryant, State Director, JETS

The Junior Engineering Technical Society (JETS) is a nonprofit educational organization founded in 1950 with national headquarters at the United Engineering Center in New York. The primary activity of the society is to sponsor an extracurricular program for secondary school students; that is, those in grades 9 through 12 who are interested in engineering, science, and technology. These activities are designed to give the student a preview of careers in a wide range of professional engineering and scientific fields. The idea is to provide the student with an opportunity to apply classroom theories in the actual development,

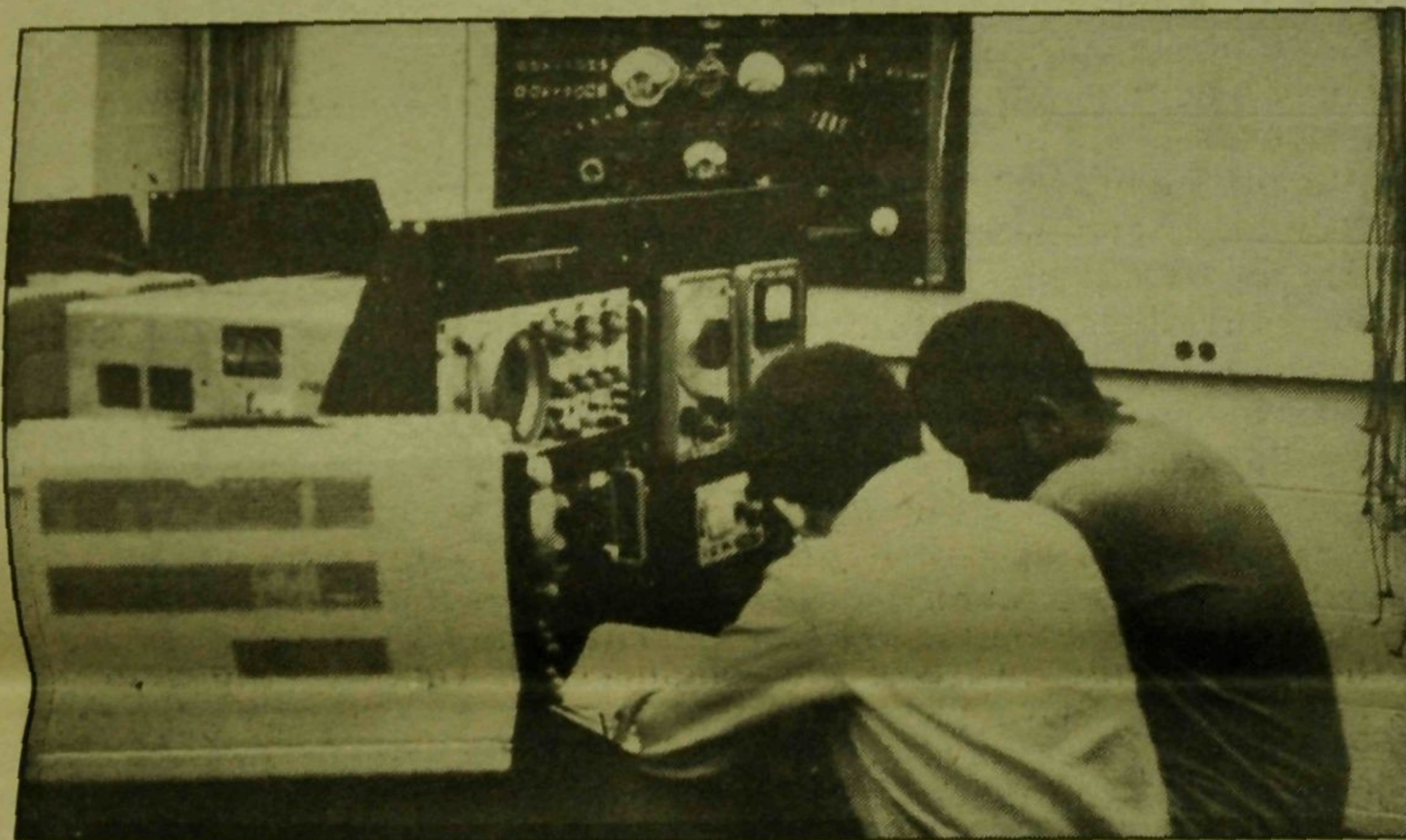
design, and construction of technical projects, papers, or individual research, with the assistance of a high school faculty member and professional engineering advisors from the various engineering disciplines.

It is felt that this type of acquaintance with professional men and women and the experience gained from actual work while still in high school will enable the student to better determine his interests and capabilities for selecting a lifetime career in engineering.

JETS participation and activities center around JETS chapters during the school year. The organization of the JETS chapter is very similar to that of any other high school interest group. A number of students who



Aviation is one of the many areas explored by high school students enrolled in the JETS summer program.



Two high school students are hard at work during a Electrical Engineering self-teaching laboratory.

have an interest in the field of engineering gather together under the sponsorship of a teacher and one or several local interested engineers who act as engineering advisers. The chapter meets at the members' convenience to investigate everything they can about engineering. The necessary professional education, work opportunities, and various fields of practice are looked into. The meetings usually include lectures, experiments, tours, and films on any appropriate subject which the group wishes to cover. Through the chapter, students have an opportunity to meet engineers and find out firsthand exactly what is done within the profession itself.

In high school the student is not, in general, exposed to engineering. His teachers, counselors, and administrative officials are mostly products of a college of education. Very few, if any, have any contact with engineering. A student who is considering a career in that field will be faced with a patent lack of engineering guidance.

The public cannot expect teachers to know about every career and every profession. Engineering, because of its multi-

disciplinary and multi-interest practice, is one of the few professions rarely well understood or known by the non-practitioners. A means of remedying this lack of "know how" is provided by JETS.

JETS provides a vehicle through which a high school student can investigate the engineering profession prior to committing himself to a college education.

JETS operates through a chapter or club either within the high school program or as an extracurricular activity. Through the efforts of interested engineers, educators, parents, and students, the program has grown so that it now has chapters operating in over 100 high schools in the State of Illinois.

JETS has been most effective in helping students to decide what area of engineering they wish to pursue. At the same time, it has helped to call engineering to the attention of many students who have not considered the possibility of a career in this broad disciplinary area. Some students also determine, through activity in

Con't. on Page 14

Job Outlook from page 3

If you follow the course of 1974 engineering graduates the picture is somewhat less optimistic. There have been some layoffs in the automotive and the semiconductor electronics industry. These have not reached "crisis" proportions by any means, but it does mean that recent engineers with little experience may find themselves looking for a new job. Fortunately, a number of companies are still looking for experienced engineers, and these people are not having too much difficulty in relocating. However, if the layoffs reach "crisis" proportions, there may be some difficulty. An indication of the deepening recession is the fact that nearly twice as many experienced Illinois engineering alumni are looking for jobs than did one year ago. The Engineering Placement Office helps these people relocate and an average of 10-15 alumni per month find new jobs through using the Placement Office services.

Another method by which these alumni find jobs is in the **Job Opportunity Bulletin** issued by the Engineering Placement Office every two weeks. It reports all of the job vacancies that have come to our attention from employers who write us. The number of job opportunities in current bulletins is not significantly different from the number a year ago.

In view of all the above, what should the high school junior or

senior do today in planning a career for the future? Young people with an aptitude for science and mathematics and with a keen interest in solving problems should not be deterred from considering a career in engineering or science. However, the fact that the job market looks good for engineers is not sufficient reason for a high school senior to enter the field if natural inclinations lead elsewhere. This is where the high school counselor and the University of Illinois Student Counseling Service can be of help to students wrestling with career decisions. The Engineering Placement Office also has an excellent career planning workbook which is available for free distribution. High school seniors should seek confirmation of their aptitude for engineering and only then should they enter the field.

A student's interest is probably as good a guide as any for initial selection of college careers. Students are seldom interested in mathematics, physics, and chemistry unless they are good in these fields. Experience has shown that students who do well in these subjects also have the ability to do well in engineering if they are motivated and have sufficient interest. Many students do not know whether or not they have an interest in engineering because of a lack of experience in the field. If you find yourself in this category,

this should not complicate your decision since you may come to enjoy solving problems or take an interest in laboratory or problem-solving courses. If so, engineering should definitely be one of the alternatives you consider as a career.

Many students have a tendency to think in terms of salaries when choosing a career. There is probably no more short-sighted method that one could choose for beginning a career than simply selecting the highest paid profession. Many, many years of experience has shown that graduates who are happy with their work and really enjoy it are much better paid than those who are unhappy in their work and constantly changing jobs. If you are well-suited to be an engineer, the salary will take care of itself and reasonable salary increases may be expected throughout your professional life. The Engineers Joint Council report mentioned earlier shows that, 15 years after their graduation, half of all engineers are earning over \$20,000 a year and 10 percent of the engineers are earning \$30,000 or more, 20 years after their graduation. Even with current inflation these are quite substantial salaries!

Certain areas in engineering have special opportunities because of the special demand for graduates in those curricula. At

the present time, engineers in shortest supply are ceramic engineers, chemical engineers, metallurgical engineers, and industrial engineers. Because of the short supply, special inducements may be available such as scholarships, grants, or increased opportunities to participate in the cooperative engineering education program. Once again, though, interest comes into play in such decisions. A student should not choose one of these engineering fields over electrical or mechanical engineering simply because a grant may be available. The aptitudes for all of these fields of engineering are roughly similar, but interest enters into the final decision which, many times, may be delayed until the sophomore year of college.

Additional information concerning the current job market may be obtained at the Engineering Placement Office, 109 Engineering Hall. Recent salary studies are available as well as surveys of engineering graduates five and ten years after graduation.

The career planning workbook mentioned earlier is also available in this office. Parents or others, reading this article after Engineering Open House is over, are especially invited to write the Engineering Placement Office for any of these brochures or with any questions concerning college or an engineering career.

Electrical Engineering

One of the terms that is often used to describe the Electrical Engineering Department at the University of Illinois is LARGE. With an undergraduate student enrollment of 1048, a graduate student enrollment of 317, 99 professors (more explicitly, professors, associate professors and assistant professors), and 52 separate research projects funded by contracts and grants of more than \$2,000,000 per year, it is large. Although the large size may be accompanied by some problems, it makes possible some very real and unusual opportunities that are not found with departments of significantly smaller size. Electrical Engineering is not a narrow field of study; rather, it is a broad field of study with many diverse opportunities for the student. Electrical Engineering includes such areas as: electrical power, communications, control, computers, systems engineering, bioengineering, electronic instrumentation, lasers, electromagnetic fields, antennas, electronic music, radio astronomy, physical electronics, transistors, and integrated circuits. With the rapid growth in electrical engineering it is no longer possible for the undergraduate student to become thoroughly knowledgeable about and understand in depth the broad field of electrical engineering in the four years of an undergraduate program. Rather, he can become knowledgeable about the field in general and

understand one or more areas within the field in considerable depth.

To provide adequate opportunities for the student to learn about the broad, diverse field of electrical engineering, a large faculty and a large student body are both necessary. Only with a large number of students can the large variety of courses be offered that are needed if, each of the areas of interest is to be covered adequately. Further, with a large student enrollment, many courses can be offered each semester and almost all others can be offered once each academic year. It is also relatively easy to bring together a large enough group of students that a new course may be offered for the first time; at the University of Illinois from three to six new courses are offered for the first time by the Department of Electrical Engineering each semester—each must attract about 15 or more students.

For each class to be successful, it must help the student learn about the topic to be covered. This, it will be recognized, requires the professor who has organized the course and teaches it to be very knowledgeable in the subject area. Students seem to learn best when the instructor's knowledge of the subject is thorough and deep rather than of a casual and survey nature. For a department to have a faculty that possess this level of knowledge about the large number of diverse areas of electrical engineering



Professor W. Albright of Electrical Engineering takes time to talk to a student after a recent IEEE student branch meeting.

seems to require a fairly large number; it is even better when more than one faculty member is capable of teaching a given course. The richness and depth of educational opportunity that a large, diverse, competent faculty provides is extremely important for an educational program of excellence.

The large program of research in which the faculty, along with the graduate students and some of the undergraduate students are engaged contributes much to the continued renewal of the faculty so that they are keenly aware of the new directions that electrical engineering takes. As a result of the involvement with research the electrical engineering department at the University of Illinois has been directly involved in some discoveries of wide ranging importance. Professor J.T. Tykociner invented and first demonstrated "Sound-on-Film" movies; more recently the log periodic antenna was developed in this department (the log periodic TV antennas which are widely used throughout the United States are particular designs based on the work done here). The prototype of a worldwide network of the high-frequency CDAA (circularly disposed antenna array) was designed and

built by faculty, staff and students of this department. The original array (of 120 element arranged in a circle about 1000 feet in diameter) continues to be used for further studies. Professor John Bardeen, one of the men who received the Nobel Prize for his invention of the transistor, holds a joint appointment in Electrical Engineering and Physics.

The presence of this research has made it easier to provide meaningful laboratories for undergraduate students in some of the emerging areas of electrical engineering. Three examples are: (1.) the Microelectronics Laboratory in which students learn how the new electronic devices (transistors, integrated circuits, etc.) are fabricated by actually making some of these; (2.) the Quantum Electronics Laboratory in which students find how lasers operate and how they can be applied; (3.) the MicroComputer Laboratory in which students assemble and test a microcomputer using some of the newest LSI microcomputer chips.

One of the significant aspects of the educational program in Electrical Engineering at the University of Illinois is the breadth and depth of opportunity for study that is available.



Two daring EE students brave the heights in making preparations for a previous Open House. They did manage to get back safely, leaving a canvas which can be seen from Green Street.

EOH 75

Society Promotes Student-Faculty Relations

by Ed Wicus, President IEEE

The Institute of Electrical and Electronics Engineers (IEEE) with over 270,000 members is the largest professional engineering society in the free world and with nearly 300 student members the IEEE student branch at the University of Illinois at Urbana is one of the largest in the United States. Membership is open to electrical and computer engineering students as well as computer science majors. The student branch holds about 10

meetings a year which are very informal. The IEEE student branch, through speakers and professional programs, gives the student members opportunities to hear and meet the top professionals of this ever-widening and demanding field.

Some topics of past meetings have been interviews and resume writing, nuclear power, video discs, sales engineering, research methods, and communications systems. Speakers have been from such companies as Motorola, Illinois Bell, Zenith Radio, Illinois

Power, Texas Instruments, and I.B.M. The student branch also gives students a chance for national recognition and cash prizes in its annual paper contest.

Another goal of the IEEE is to promote student-faculty relations. This was done by the student-faculty bowling tournament in which the faculty were thoroughly trounced by the students. A rematch is set for the spring semester. Movies of the bowling tournament were made and after some fancy film editing they should prove to be very interesting. They

will be shown at the electrical engineering student-faculty banquet to be held later this spring.

If you are interested in continuing your professional development outside of the classroom in an informal atmosphere, and you want to enjoy yourself while doing this, come and see us in 247 EEB. For Intrigue and Excitement in Electrical Engineering, join the IEEE. We've still got room to grow!

General Engineering

The design curriculum in General Engineering is a sequence of core courses beginning in the freshman year and continuing through the senior year. The students are first introduced to design in the freshman graphics course where they spend one day per week on design. They study the methodology of design and work on small design projects to gain experience in synthesis.

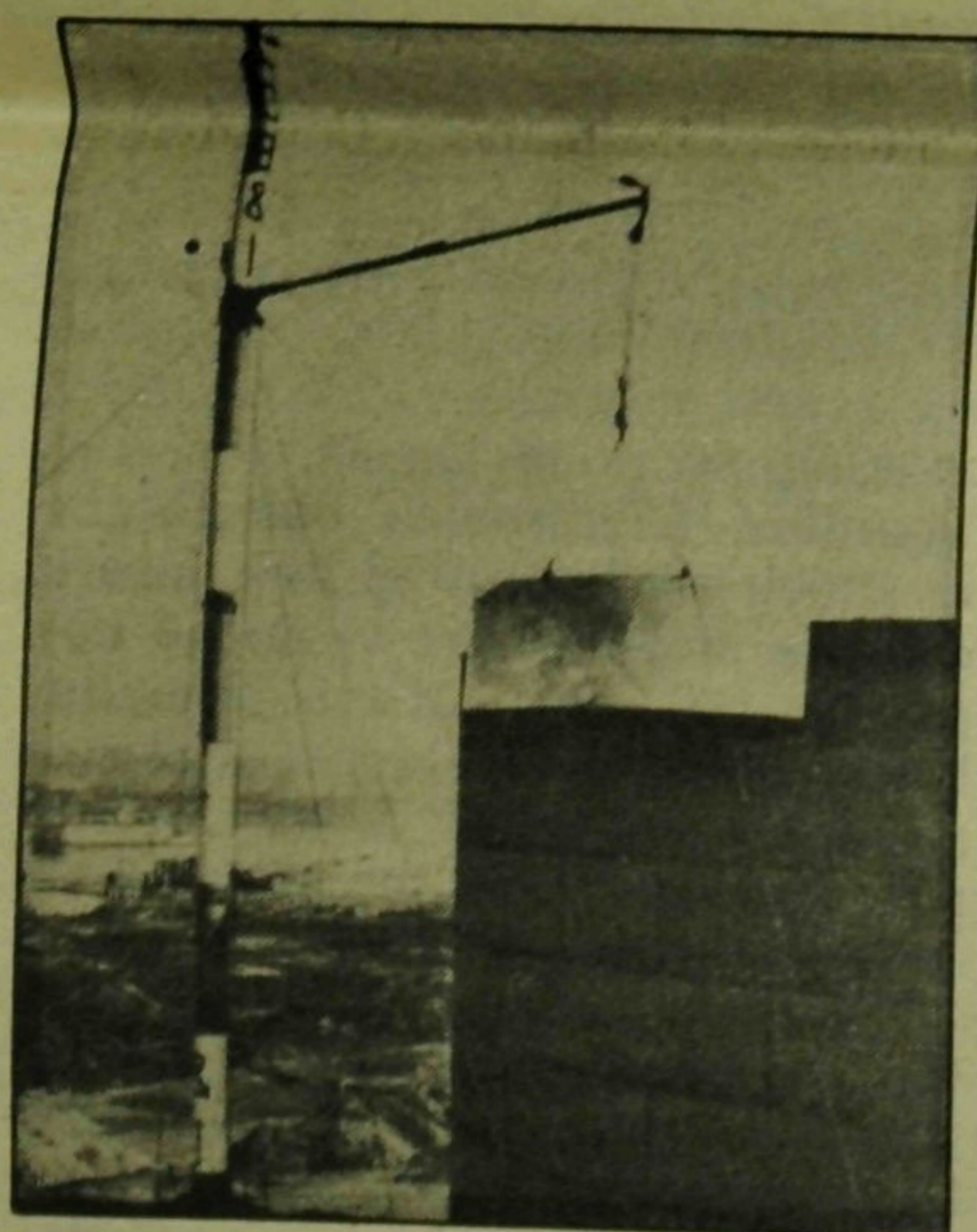
Project design is introduced to our General Engineering majors in the second semester freshman year. The objective of this course is to introduce the students to engineering design and some basic engineering analysis. Again, the students work on a design project requiring synthesizing capabilities.

Starting in the junior year, the student enrolls in courses giving him a basic background in the design and analysis of structural and mechanical systems and components. This course of study is augmented by work in system dynamics and engineering economics. The purpose of these courses is to introduce the student to a common approach to engineering analysis and design. The design sequence is completed by the senior course in project design, G.E. 242. G.E. 242 is taken by all General Engineering students just prior to graduation. The course is set up to smooth the transition from the academic

textbook world to the real-world engineering environment. In all design curriculum courses the student uses the most advanced techniques of solution, as well as learning about the classical methods of solution. Computer-aided design techniques enable the student to attack and solve problems which were essentially impossible only twenty years ago. A PDP-11-20 and an EAI 580 analog-hybrid computer are housed in the department and are an integral part of the department's design activity. For problems requiring a greater capacity than the above computers, the students utilize the University's IBM 360-75. As a result of this experience, the General Engineering graduate is not afraid to attack any problem once he is on the job.

Many engineering courses have "textbook" type problems with only one correct solution, which seldom occurs in the real world. In contrast, the project design course students are confronted with a problem that actually exists in industry, under the sponsorship of an industrial concern. With the faculty advisor and the company engineer, the project team will typically spend several weeks getting to understand the problem and finding out what they do not know. Research into areas that have not been covered in their normal academic training is usually necessary on most projects. After completely analyzing the problem and synthesizing possible solutions, a final design proposal is formulated. Final drawings and/or models are typically part of the final report which constitutes the problem solution.

Objectives that have been realized over the past several years of project design activity are the following: increased technical competence in a particular project area; increased administrative skills, including the ability to work with others, budgeting of time and money, and teamwork within the engineering project framework; development of open-ended problem-solving capacity on real-world engineering problems; close liaison with company management with possible employment to follow; smoothing of the transition from the academic world to the business-engineering environment.



A 50-ton guyless derrick was the result of the efforts of three seniors in General Engineering. This design won several national awards.



Drafting is an important part of the design courses offered by the General Engineering Department.

Gamma Epsilon is Service-Oriented

Gamma Epsilon is becoming an increasingly active and productive honor society. The members of Gamma Epsilon have undertaken a service project in which they work with a class of students at Urbana Junior High School. Mr. Robert Hesler, Urbana instructor, has his students working on the design of a hypothetical residential com-

munity, covering all aspects of its planning, layout, and construction. Gamma Epsilon members serve as consultants and advisers, working several hours a week directly with the class. The benefits and enthusiasm generated by this relationship have been both mutual and substantial.

Mechanical Engineering

Engineers are primarily creators of technical things and services useful to man. What do mechanical engineers do? They cover the entire spectrum of industrial and technical activity; they make American industry "tick".

Mechanical Engineering is the branch of engineering which studies the conversion of energy from one form to another, the design of all types of machines, the instrumentation and control of all types of physical processes, and the control of man and machine environments.

Problem: the human heart consists of two small pumps. Each has two valves, one which lets in

blood and one which lets it out. Sometimes a valve becomes defective and sometimes children are born with defective valves. Design a replacement valve which must operate 36-million times a year. The replacement valve must be made of a material which will not poison or attack the internal organs of the human body.

The problem stated above is typical of professional work being done by Mechanical Engineers. It is obvious that such problems are very broad in scope, and require an extensive knowledge of the laws of nature and the fundamental principles on which engineering is based.

campus scout



I'd be willing to bet my laminated bamboo Post Versalog that the rest of this special Engineering Open House publication is just loaded with articles by deans, department heads and honor society chairpersons proclaiming the virtues of an engineering education: it's a good school, it's a good school, and besides, it's a good school.

Figuring that you'll have had your fill of this party-line baloney by the time you get to this column, I'm going to try to take you past the realm of having your uncle Barney pat you on the head at Christmas time, saying, "Oh, yes, Illinois.

Good school for engineering" and expose you to what it is like to be an engineering student and actually live here.

The first thing you ought to be wary of is Engineering Open House. The official word is that EOH is set up so the people of the state of Illinois can view just what's going on in Big U engineering. (Note to the uninitiated: "Big U" is a nickname given to this place by students, and can only be fully appreciated by the poor suckers who try to survive school here.) I have a personal theory that the people of the state of Illinois don't give two dry husks of a cornstalk what goes on here. Actually, EOH is just a move to parade all the neatest toys on campus before the wide and admiring eyes of visiting high-schoolers. Yes, Kids (and parents),

you are being recruited. It's a fact of life that University appropriations are closely tied to enrollment—I'll let you extrapolate the rest.

Of course what they don't tell you is that much of what you will be seeing is senior and graduate work, and unless you are smarter than most, getting there means several years of calculations, tough classes, and a heavy dose of the inside of your room.

One reason you'll see a lot of the inside of your room is that engineering is basically a participation sport, and you're going to have a lot of problems to do. While many students in other colleges on campus have come to expect a short first class day, this is not so in the college of engineering. The teacher will enter the classroom, deliver a 10 minute speech, and

start writing like he is trying to put chalk companies out of business.

The speech typically goes like this: In hobbles Clyde Rule, ageing but brilliant professor, and says, "There will be three hour exams and a final in this course. Problem sets will be due every day. For tomorrow, work every problem in the book. If you have questions, I will give you the grader's phone number, but I wouldn't count on finding him, because he wants nothing to do with you." (Note: If this is physics 106, 107 or 108, the teacher will at this time inform the kids in the back of the room that they will need binoculars.) "By the way, just so you won't think that I'm a nice guy, the grading in this course will be merciless."

Grinding through a rough curriculum with a lot of intelligent

Con't. on Page 14

Metallurgical Engineering

The metallurgy and mining department of the University of Illinois houses a vast variety of research programs in metallurgy and materials science. Emphasis is placed on both engineering applications and the scientific aspects of materials.

The scope and importance of materials research cannot be overestimated. More than three-quarters of the known chemical elements are metals. Every day metals and metal products are utilized to sustain our existence. Materials research holds the key to many of the technological advances of the future. Energy production, space flight, medical transplants, and other frontiers all

rely on material property improvements.

The combination of metallurgy and materials science provides an extensive research area. Graduate interdisciplinary programs exist among metallurgy, ceramics, civil engineering, chemistry, electrical engineering, mechanical engineering, nuclear engineering, and physics. Specific departmental research programs presently include low-cycle fatigue of steel, gases in refractory metals, magnetism in alloys, electronic structure of transition metal alloys, stress-corrosion studies of metals and alloys, fatigue behavior, welding, nondestructive testing, electronic properties of

metals, nuclear magnetic resonance, studies of metals, growth of thin films, properties of thin films, martensitic transformation in iron alloys, solid state phase transformations, hydrogen embrittlement, properties of surfaces, friction and wear, biomaterials, powder metallurgy, recrystallization behavior and textures, interstitial solid solutions and precipitation, properties of nuclear materials, mechanical behavior of brittle materials, lattice defects, diffusion, dislocations and surface barriers, surface reactivity of lattice defects, super-plastic materials, materials for power reactors.

Opportunities in Metallurgy

The field of metallurgy has seen rapid expansion in recent years. Metallurgy has become involved in interdisciplinary studies where technological advance is dependent upon finding new materials for design. One example is the area of nuclear power generation, where the lack of metals capable of withstanding high temperatures limits reactor design. Another example is spacecraft, whose building was dependent upon the development of high strength steels and titanium alloys.

Although the metallurgist is usually associated with the steel industry (which does hire a large

number of metallurgists), there are many areas in which a metallurgist may work. Any manufacturing company which deals with items containing metals will employ several metallurgists. These industries include aircraft and automobile industries, where assurance of a sound metal product is essential.

The field of metallurgy is broad and constantly expanding. The metallurgist can be proud of the advances in technology which were made possible by improved materials developed by his profession.

Educational Affairs Committee Makes Improvements

by Jim Smith, Chairman EAC

The Educational Affairs Committee of Engineering Council is the engineering student body's main channel of communication with the college administration. Formed in December 1971, EAC was charged with the following responsibilities: (1.) To act as an input into the administration office in regards to areas of student interest. (2.) To be of beneficial assistance to the college in reviewing and evaluating proposals. (3.) To provide a source of information to Engineering Council and the Student-Faculty Senate. (4.) To always be cognizant of the concerns of the engineering student body.

EAC has expanded its role by instituting its own programs. An Engineering Familiarization Program was set up in which engineering students visit an industrial facility for several days and observe the actual practice of engineering. Mini-Courses were established for the semester break to give students "practical" courses such as welding, small engine repair, sheet metal work, and machine shop. These two programs have been accepted very well in the short time that they have been in existence. EAC now meets with Dean Drucker, the Head of the College of Engineering, to discuss topics as "What should

be the university's role as a research institute and as a teaching institute?" and "What should a student get out of a college education?" EAC is also working with the Engineering Placement Office to provide more summer jobs for engineering students, and preparing an engineering information pamphlet which the Committee hopes to publish next year.

While working on these projects, EAC has not neglected its original responsibilities. The Committee has conducted surveys on the interest in an engineering-economics degree. Changes are being made in Math 345 due to a report by EAC to the College Policy and Development Committee. Each year EAC gathers ideas about Engineering 100 from freshmen and forwards these ideas to the Dean's Office. EAC is often asked to make suggestions for programs that are being instituted or changed.

If you are interested in helping EAC when you are a student here, come to an Engineering Council meeting and let us know. Even if you do not serve on the Committee, please return our surveys and let us know when you think a change should be made. Knowing your opinion is the only way that we can make the Educational Affairs Committee serve you.

Junior College Program

Most Illinois Community Colleges have a pre-engineering program comprised of two years of study. Normally, students completing such programs can transfer to the College of Engineering UIUC and complete their engineering studies in two additional years.

The Engineering College has recently coordinated these programs with 26 Illinois Community Colleges to insure no loss of transfer credit. Ten more Community Colleges are in the process of completing coordination of engineering programs. An individual brochure has been developed for each of these Community Colleges, listing the courses to be taken in the first two years and the requirements which would remain after transfer. Copies of these brochures are available in 207 Engineering Hall or through the Community College.

Normally, transfer students are expected to have 60 or more semester hours of credit prior to transfer and a grade point average of 3.25 or better on a 5.0 scale. In the first two years of pre-engineering study, students are urged to complete their basic sequences in mathematics through calculus, general physics, general chemistry, English composition, and computer programming (Fortran).

The Community Colleges which have completed a coordination with the College of Engineering

St. Pat's Ball Approaches

With all the excitement of Engineering Open House here, let us not forget the patron saint of engineers, St. Patrick. It is only fitting that we have a special dance in his honor. The St. Pat's Ball has always been the climactic end of every successful EOH. It is at this dance that the "coveted" EOH awards are presented, and a chosen few engineering students are honored by being made Knights of St. Pat.

The ball is a semi-formal dinner-dance which this year will be held at the Ramada Inn in Champaign on March 15. The dinner will begin at 7 p.m. and will go into the wee hours of the morning. Of course there will be a cash bar to celebrate the closing of another successful Open House.

The band proves to be excellent, as its members are in the famed University of Illinois Jazz Band and their large repertoire of music is sure to please all.

So be sure to come to St. Pat's Ball where you can eat, drink and dance your troubles away. The dance is open to all, as you don't have to be in engineering to enjoy yourself! Bring a friend for a good time will surely be had by all.

UIUC are: Belleville Area College, Black Hawk College, City Colleges of Chicago, College of DuPage, College of Lake County, Danville Junior College, Elgin Community College, Highland Community College, Illinois Central College, Illinois Valley Community College, Joliet Junior College, Kankakee Community College, Kaskaskia College, Lewis & Clark Community College, Lincoln Trail College, Oakton Community College, Olney Central College, Prairie State College, Rock Valley College, Sauk Valley College, Spoon River College, Springfield College in Illinois, Thornton Community College, Triton College, Waubesa Community College, William Rainey Harper College.

Our couputer has been coming up with snap decicions ever since someone dropped a rubber band into it.



Student projects that are exhibited at Engineering Open House are eligible for one of the many EOH awards given each year. This smiling senior has just learned that he won first place.

Engineering Physics

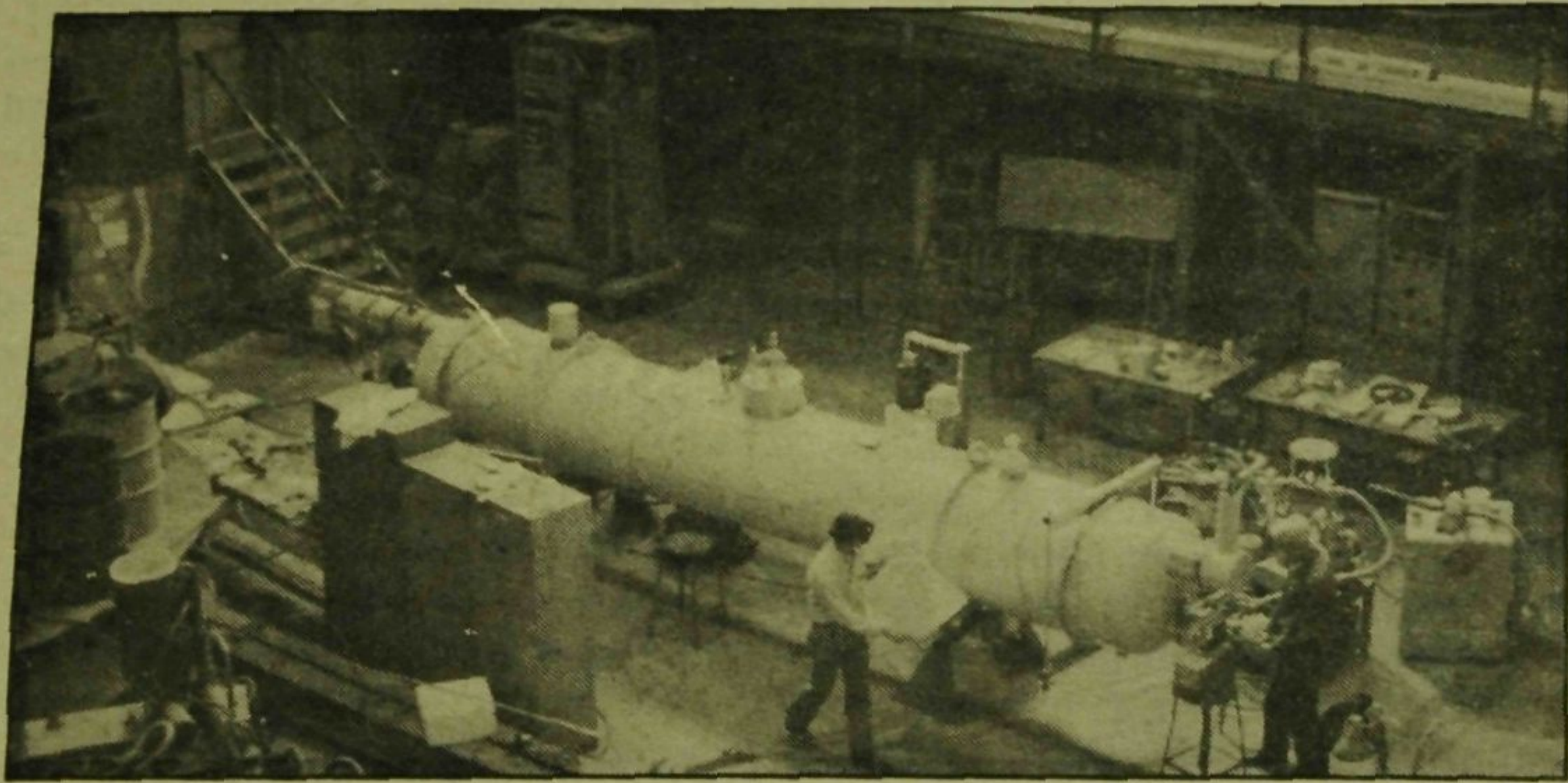
New frontiers challenge the attention of physicists everyday, and research in the Department of Physics is aimed at opportunities in a wide variety of areas. In its history of more than a century, the department has grown strong in teaching and in research in fundamental physics. It is ranked among the ten best physics departments in the United States and is known worldwide for its impressive list of well-known faculty and academic staff, the most notable of whom is John Bardeen, two time Nobel Prize winner and pioneer in the field of superconductivity. The departmental roster lists approximately 130 faculty and 280 graduate students, making it one of the three largest graduate schools in the country.

Physicists in the department carry out work at low temperatures, including the millikelvin range, and at high energies, including experiments at the 400-Gev machine of the National Accelerator Laboratory in Batavia, Illinois. Solid-state physics, both theoretical and experimental, is a broad field of traditional strength in the department and includes studies of superconductivity, cooperative phenomena, magnetic resonance and relaxation, ultrasonic and elastic properties, Raman and Brillouin spectroscopy, crystal defects and diffusion, and the electronic structure and properties of solids. Experimental work in high energy physics is carried out not only at Batavia but also at other major accelerators of the world.

High energy physics embraces studies of high current interest in weak interactions, in strong interactions, and in electromagnetic interactions. Nuclear structure is being probed using electrons from the unique microwave superconducting accelerator, while a much larger accelerator that can accelerate particles upwards of 300-Mev is about to be installed. Biophysical research on enzymes and other materials is being pursued by means of Mossbauer and other techniques. Theorists study both the phenomenology and fundamental theories of high-energy particle physics. Research in astrophysical theory has become a major departmental program.

Opportunities for physics students and faculty are broadened through cooperative arrangements with other units of the university. These fields include astronomy, atmospheric science, semiconductor and high-pressure physics, surface physics, plasma and ionospheric physics, and geophysics. From the resources of the Materials Research Laboratory comes the principal support of low-temperature and solid-state physics. Other research support comes from the state of Illinois and from many grants and contracts. In addition, unrestricted grants in support of research or grants to support graduate fellowships were available during the year from a number of industrial sources.

Programs in physics, then, at the University of Illinois represent a close coupling between research and teaching at the graduate and undergraduate levels and close collaboration between theoretical and experimental physicists. It reflects the increasing complexity of fundamental physics research. At the same time the connections with other disciplines as described earlier have substantially expanded the opportunities for physics students in research and in future employment. Graduates of the department are widely distributed in universities, industry, and governmental laboratories. These individuals, in themselves, are a testament to the outstanding quality of physics at the University of Illinois.



The new 15-Kev linear accelerator is soon to be put to use at the physics research laboratory.

Jets continued

a JETS chapter, that their interest in engineering is not as true as they believed it to be.

Support for JETS comes from many sources. The Colleges of Engineering helps through its faculty working with the students or administering state and regional offices. Professional engineers cooperate in every way they can. Organizations such as the Illinois Society of Professional Engineers with its many local chapters are strong backers of JETS. Industry helps by giving financial support, and opening plants to tours. Many of their engineers also contribute with their time in chapter activities.

JETS also sponsors the National Engineering Aptitude Search (NEAS), an engineering aptitude test that is open to students in grades 9 through 12. The test is given once a year. It is suggested that a student who feels he may be interested in engineering take the test early in his high school program in order that he may make correct academic choices which will enable him to enroll in a college of engineering. Each year hundreds of students take the test in various testing centers across the state. The test serves not only to let the student know whether he has an aptitude for engineering or not, but also it identifies those students who are interested in engineering, and early identification is important for good engineering guidance.

The third major activity of JETS occurs each summer when it sponsors four two-week summer programs with three colleges of engineering. These programs are held at Bradley University in

Peoria, the University of Illinois at Chicago Circle, and two programs at the Urbana-Champaign campus of the University of Illinois. These programs, which accommodate approximately 40 students each, bring high-ability high school students, who will be entering their senior year in the fall following the program, to the college campuses.

During those two weeks, the participants are exposed to engineering lectures, laboratories, computers, discussion periods, and mathematics as applied to solving engineering problems. They leave campus with a better understanding of what engineering is and what it entails. Staff members on the three campuses contribute their time and efforts to these programs. The only charge to the student is for room, board, and equipment. Scholarships are available for participants with demonstrated financial need.

The second program held at Urbana-Champaign is the Minority Introduction to Engineering (MITE) program. MITE was held at ten different university campuses across the country during the summer of 1974. Through MITE, over 300 minority students were able to find out about engineering. MITE evolved from the Inner-City Engineering Orientation Program, which was first held on the Urbana-Champaign campus in 1969, and which has continued each summer since. These programs are funded by industrial contributions so that participants attend at no cost to themselves.

JETS in Illinois offers any high school student an opportunity to investigate engineering as a possible career choice. It poses no

obligations and can only benefit a student. For schools where chapters do not exist, individual memberships are available.

State Headquarters are located in Room 214 Transportation Building, University of Illinois, Urbana, Illinois 61801.

Physics Society Attracts Non-majors

by Jorge Schulz, President Physics Society

The Physics Society is an organization of students whose common interest is physics. Membership, however, is by no means limited to physics majors: students in biology, psychology and even physical education are members.

Meetings of the Physics Society are held every three weeks. At this time current topics in physics or other popular subjects are discussed. During the past semester, speakers have presented information on the TRIGA nuclear reactor, current research in astrophysics, and the types of major study and possible financing available for graduate study. A field tour of the National Accelerator at Batavia, Illinois was also scheduled. Future meetings will include discussions of low temperatures, biophysics, and the effects of light and sound.

Campus Scout cont'd
from page 12

competition has its benefits, however. For instance, if you're not a drunk by the time you reach junior year, you know you never will be.

And then there's that dreaded disease that boggles the mind, cramps the stomach and frequently makes you break into a cold sweat—Computer Science 101.

This course typically takes twice as much time as any other course, which is about six times as much as you'd like it to. The exams are long and cover the most trivial junk ever conceived by a vengeance-crazed teaching assistant. For example: "42. If the computer is performing a nested do-loop and in the third execution you slam it in the side with a 22 pound salami, will it: (a) Belch; (b) Demand a recount in the 1960 presidential election; (c) Begin printing the Torah in Hebrew?" And they get worse.

Last but not least on the serious side we have the great Illinois Divide, that is, Green Street. Students from Engineering (on the north side), and students from the University's other 11 colleges (on the south side), know equal amounts about each other, that is, nothing. Engineers tend to think other students are lazy bums who "waste" time on the Liberal Arts, and other students have a tendency to think Engineers are cold hearted creeps who sleep with their calculators. If you should decide to come to school here, don't be a victim of this appalling ignorance. Get across Green Street for more than just to cash a check at the Union.

If you don't take advantage of the many ideas and people bursting from every corner of this, one of the country's largest Universities, then in four years when they hand you a B.S., that's just what your education will be.



ENGINEERING
OPEN HOUSE

Theoretical and Applied Mechanics

Besides offering an undergraduate curriculum in engineering mechanics, the Department of Theoretical and Applied Mechanics serves the college by offering to all engineering students courses in statics and dynamics, in mechanics of deformable bodies, in materials science, and in fluid mechanics.

Department facilities are utilized for two primary purposes: (a) to gain new knowledge of the fundamental behavior of materials, members, and of physical systems, and (b) to correlate or verify the theoretical analysis of an idealized system by critical observations of the characteristic response of an experimental model or prototype. In general, the research studies

undertaken are of a fundamental nature that supplement the educational efforts of the department. Some of the research is primarily theoretical and involves highly complex mathematical analyses of stresses, vibrations, fluid flow, or basic material behavior; other research involves both analysis and experiment and may include the development of new equipment of instrumentation and the interpretation and correlation of experimental data with theory.

New and challenging problems in deformation and fracture of metals and non-metallic structural materials are investigated in the department's fracture laboratory. Concepts of the structure of the materials and hypotheses of the mechanisms of deformation and

fracture are employed to formulate theories of behavior of the materials subjected to various complex environments. High and low temperatures as well as vacuum and corrosive atmospheres indicate the scope of experimental conditions that are important in influencing the mechanical behavior of engineering materials. Yielding, creep and relaxation, ductile or brittle fracture, fatigue fracture, and stress rupture are types of failure that these research activities can help to avoid in machine and structural members under severe conditions.

Analytical investigations based on such mathematical theories as elasticity, elastic stability, inelasticity or plasticity are used to predict the behavior of such

members under load. The photoelasticity laboratory of the department is equipped for the analysis of stresses in bodies of irregular or complicated form for which mathematical or theoretical methods are inadequate. Continuous emission gaseous lasers and pulsed ruby lasers are being used as light sources for high speed dynamic and for three dimensional photoelastic studies.

The dynamic and vibrational behavior of individual members or mechanical systems is also the subject of department research. The vibration laboratory employs various models and instruments for illustrating typical vibration phenomena and for determining wave form and frequency of vibrations in machine parts and structural members.



Much of the research equipment used at the University needs frequent calibration. This physicist is making some fine adjustments before beginning an experiment.

Women Learn About Engineering

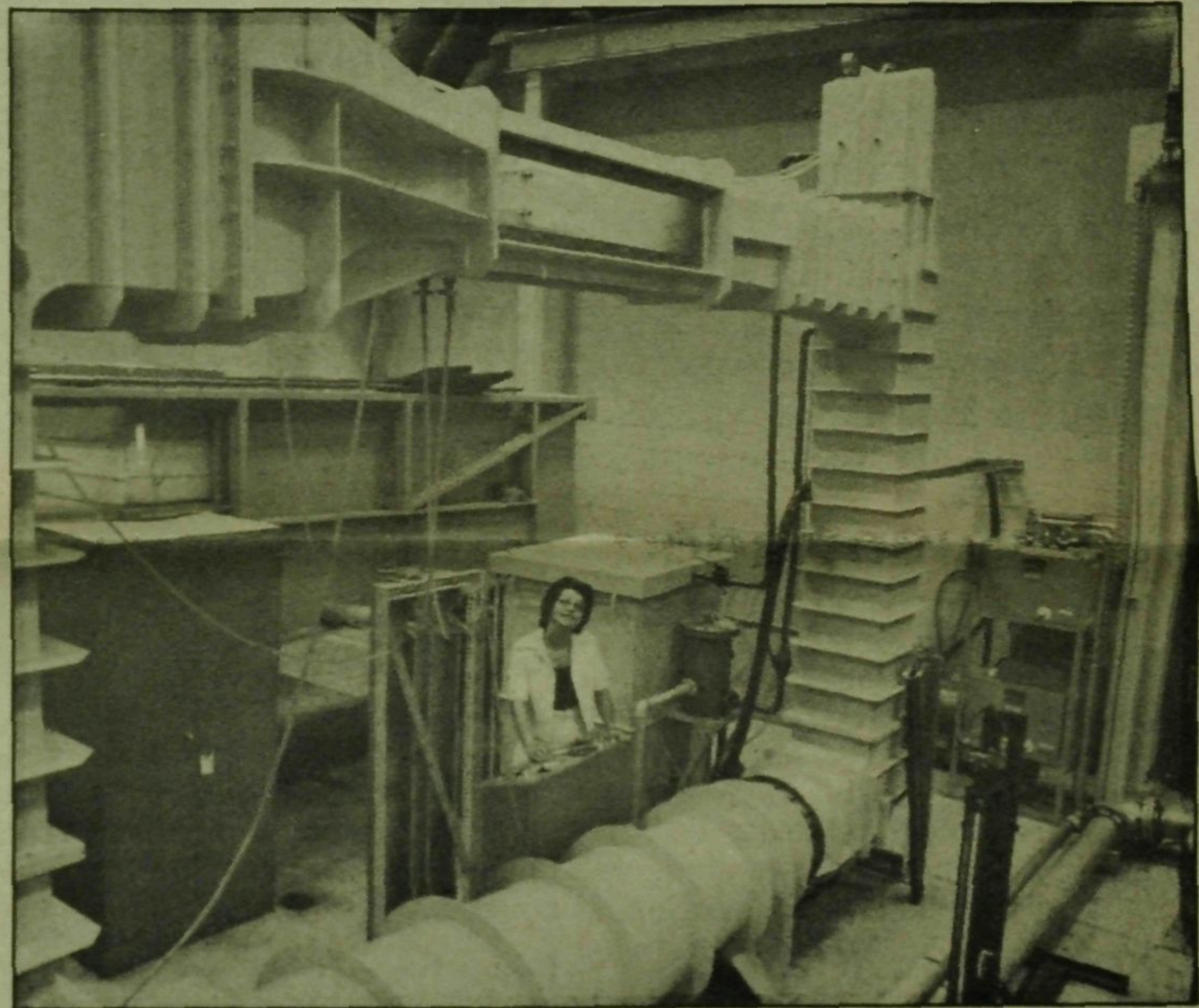
by Carol Woodyard and Linda Aberle

Future Woman Engineer! Can you imagine a time when women will no longer be a minority of the engineers? The Society of Women Engineers' Open House display has taken the view that in the year 2001 enrollments of women in engineering will be equal to that of the men. But until that time SWE may have something special to offer you!

Do you enjoy math problems and find them challenging? How about physics and chemistry—do you feel a deep sense of satisfaction knowing that you can handle these sciences? Have you ever thought about extending your capabilities to a career that would utilize them? If you have, but you couldn't come up with an answer, consider the following: engineering.

First, let's get the facts straight. Computer design and development is no more masculine than interior and fashion design is feminine. Engineers do not have to be physically strong for they don't work on dirty assembly lines. Analytical minds are more important than mechanical abilities. And engineers do find themselves in positions of responsibility and leadership.

Now the questions start coming! The student branch of the Society of Women Engineers at the University of Illinois can help answer all your questions. One of the goals of the society is to encourage female high school students to pursue their scientific interests, and to inform them of the



Women in all fields of engineering find challenging careers in industry, government and academia.

Answers to Quiz

1. False. The foreign language requirement has been dropped in the College of Engineering at the University of Illinois.

2. There are 7. Bradley, Southern Illinois University—Carbondale and Edwardsville, Illinois Institute of Technology, Northwestern, University of Illinois—Chicago Circle and Urbana-Champaign.

3. False. The College of Engineering accepts applications up to June or July.

4. According to the Engineering Manpower Commission of Engineers Joint Council there will be 36,000 graduating engineers in the class of 1976.

5. According to the Bureau of Labor Statistics, the number of new engineering graduates needed in 1976 will be 48,000.

6. According to Dean D. Opperman of the University of Illinois Engineering Placement Office, the starting salaries for graduating engineers is \$12,000.

7. Dean H. Wakeland of the University of Illinois College of Engineering estimates that 5 percent of freshmen are women

with an increase in demand of 100 percent.

8. According to Dean Wakeland, 4 percent of engineering graduates represent minority groups.

9. The majority of Illinois Community Colleges have pre-engineering programs consisting of math, physics, drafting, and other basic engineering courses.

10. According to Directions '80 Magazine, the 800,000 engineers in the country make up the second largest profession. For men, it is the largest.

opportunities that await them in a career as an engineer.

What do engineers do? SWE has been answering this question many times and in many ways. Field trips to a radio telescope facility, industrial plants, and a nuclear reactor are only a sample of the activities members have attended so that some of their questions could be answered. Guest speakers give presentations on topics ranging from working at a large research laboratory to teaching through the computer-based program known as PLATO to career opportunities. They are often helpful in alleviating members' anxieties about what it is like to be an engineer. The most important way in which SWE has answered some questions was in sponsoring a career counseling conference on women in engineering. Women representing industry, government, and academia discussed various aspects of engineering with high school girls from every corner of the state. The reactions and responses of the girls following the conference can be summed up in three words: "It was great!"

Besides sponsoring conferences, taking field trips, and hosting guest speakers, SWE is a source of new friendships with fellow students and with the faculty. Social activities include a picnic in the fall, a Christmas party, and a Mom's Day luncheon. In addition, SWE holds joint meetings with other on-campus professional societies.

Consider the following: "My previous engineering jobs in design or system integration have been on products such as weather satellites, jet engines, and nuclear reactors. This succession of different, responsible jobs has meant a career that never gets stale." And that is what engineering is all about; challenging, stimulating, diverse, satisfying. You have nothing to lose and everything to gain.

Wrong Stone—"My husband didn't leave a bit of insurance." "Then where did you get that gorgeous diamond ring?" "Well, he left \$1,000 for a casket and \$5,000 for a stone. This is the stone."

ENGINEERING OPEN HOUSE IS BROUGHT TO YOU BY:



CENTRAL COMMITTEE

CHAIRMEN

Bill Buford
Betty Richards

PUBLICITY

Roy Kaelin
Pat Michael

AWARDS

Lee Thompson

PROGRAMS

Larry Schulz
Kathy Davis
Larry Schulz

TOURS & CENTRAL INFORMATION

Tom Schaeffges
Monroe Shumate
Steve Cherry

SAFETY & TRAFFIC

Zack Widup
Tom Gehrke

Departmental Chairpersons

Aeronautical and Astronautical

Linda Aberle
Mark Moekel

Agriculture

Dave Anderson
Nick Hoyle

Ceramic

Matt Ferber
Debbie Mondy

and Chemical

Charles Modica

Civil

Mitch Brachman

Computer Science

Bob Funk

Electrical

Gene Gurley

General

Steve Litchfield
Scott MacFarland

Mechanical and Industrial

George Rowe
Steve Wilmes
Gene Younker

Nuclear

Dan Ingersoll

Metallurgy and Mining

Bill Mattheessen

Physics

Jorge Schulz
Steve Stuckemeyer

Theoretical and Applied Mechanics

Ken Kauffmann

Faculty Advisors

Aeronautical and Astronautical

C.E. Bond

Agriculture

L.E. Bode

Bioengineering

C.E. Bowman

Ceramics

C. G. Bergeron

Civil

J.E. Stallmeyer

Computer Science

S. R. Ray

Electrical

E. A. Mechtly

General

R.A. Jewett

P. Steinbeck

Mechanical and Industrial

D. H. Offner

Metallurgy and Mining

H. Fraser

Nuclear Physics

D. Sutton

Theoretical & Applied Mechanics

F. G. Bauling

Associate Dean's Office

C.S. Larson

Jets Coordinator

Dave C. O'Bryant

Dept. Faculty Rep. - C.S.L.

Jon W. Culton

Advisors at Large

M. VanBlaricum

P. VanBlaricum

Also

J.W. Culton

Dean Larson

D.C. O'Bryant

M. Vanblaricum

P. Vanblaricum

Industrial Exhibitors

Illinois Central Gulf Rockwell International
Railways. Union Carbide
Microdata Whitcomb General
Pratt and Whitney Aviation

We would like to thank all those whose participation and effort made this year's open house a success. Special thanks go to:

Professor Robert McCloy, Aeronautical Engineering; Mr. Don Molnar, University Architect; Mr. Tom Jones, Office of Public Information; Mr. Dick Sublette and the Daily Illini Staff; Pam and Mike VanBlaricum (for getting us started!)

Betty Richards and Bill Buford
Co-Chairpersons EOH '75

Open House Donors

1. Honeywell, Inc.
2. Borg-Warner Foundation, Inc.
3. Monsanto
4. PPG (Pittsburgh Plate Glass)
5. Brown & Root, Inc.
6. Caterpillar Tractor Company
7. Illinois Tool Works, Inc.
8. Barber-Greene Company
9. Commonwealth Edison
10. Abbott Laboratories
11. Republic Steel Corporation
12. Union Carbide Corporation
13. Atlantic Richfield Company, Employee Relations
14. Dow Chemical USA
15. John Deere and Company
16. Procter & Gamble Manufacturing Co., Chicago
17. Chicago Bridge & Iron Foundation
18. Harza Engineering Company
19. Western Electric, Hawthorne Station